Excavating Engineer

founded 1905

AUGUST 1961

Biggest road job in Montana's history has majestic Snow mountains for background. Loading rock wagons is a 5-yd. shovel. Story begins on page 14.

engine power
BY CATERPILLAR

75% cut in fuel costs leads to purchase of second Cat Natural Gas Engine for increased quarry efficiency

The McClinton Bros. Limestone Quarry is located at Johnson, Arkansas, five miles north of Fayetteville. Products are dry white limestone, cement, asphalt and concrete mix, cement blocks, and aggregates. Caterpillar Engines have played a large part in increasing quarry efficiency.

Owner Clark C. McClinton beside the Cat G375 which furnishes power to drive the quarry's motors. His experience with this engine led him to the purchase of a second, the G342, for the impact breaker.

The new Cat G342 supplies power for an impact breaker. It replaced an electric motor and has proved to be more economical and more efficient for this operation.

Clark C. McClinton bought his first Caterpillar Diesel over 14 years ago. When he was ready with a modernization plan for his quarry at Fayetteville, Arkansas, he purchased a Cat G375 Natural Gas Electric Set for prime power. The result: 75% savings in fuel costs and maintenance outlays. In another step of his plan: an engine to power an impact breaker, Mr. McClinton did not have to make a choice. It had already been made for him by his experience with Caterpillar Engines, particularly the G375. "The fuel economy and low initial cost per horsepower convinced us that another Cat Natural Gas Engine would be a worthwhile addition to our quarry." In addition to replacing an electric motor for powering the impact breaker, the Cat G342 also eliminated the need for a transmission to vary the speed required for stone fineness.

The reason you get such dependability from Cat Natural Gas Engines is that they are built essentially as diesels—only the pistons and fuel systems have been changed for natural gas operation. This built-in diesel strength allows high compression ratios for high horsepower output and superior fuel economy. For the full story, see your Caterpillar Dealer. He can show you dramatic proof of the superiority of Caterpillar Natural Gas Engines. He's listed in the Yellow Pages. Or write Engine Division, Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR

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Engine Division, Caterpillar Tractor Co , Peoria, Ill.

Excavating Engineer

founded 1905

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Two cost-whacking Payhauler units equal five 11 cu. yd. haulers

—for Quality Lime Products Corp., Sumterville, Florida

Up the soupy, slippery ramp, the 95 Payhauler steadily climbs out with its 27-ton loads of lime rock. Dragline excavated from underwater, the dripping wet rock keeps the ramp sloppy, while being hauled up to the stockpile.

Quality Lime Products Corp., Sumterville, Florida, has proved that two 95 Payhauler units match production of *five* 11-cu. yd. end-dumps. The savings in labor and operating cost are huge!

Only two rigs to man, fuel, and maintain instead of five. Only minimum dead weight to move. Payhauler has the International-developed weight-shedding corrugated body, that increases ton-toting capacity and climb-ability.

"On this wet ramp operation, the DT-817 engine, through torque converter transmission, assures maximum tonnage without loss of traction," states Superintendent W. W. Reynolds. "The Payhauler is well-balanced, easy to operate, and operator acceptance has been excellent. Each '95' stockpiles up to 1,500 tons of material per 10 hrs., hauling 1.3 miles."

Power-punch of the 27-ton 95 Payhauler is the International DT-817 diesel—turbocharged to deliver 375 high-torque hp, through power-shift torque converter or 9-speed air-shift transmission. The 19-ton 65 Payhauler is also powered by the "817," naturally aspirated to produce 250 hp through 10-speed constant-mesh transmission.

And both Payhauler models have full-torque-taking planetary final drive design—reserve area power braking—"one-hand," road-holding power steering—11-second dumping.

Compare Payhauler grade charts—compare cycle-gaining Payhauler performance on grades and tough hauls. Size-up Payhauler dependability and long life features. Let your International Construction Equipment Distributor demonstrate.

In typical slippery, sloppy going, a 95 Payhauler climbs with its full load of wet lime rock—for Quality Lime Products Corp., Sumterville, Fla. The ramp rises 40 feet, and has two turns, in the first 500 feet of the haul!

With exclusive action-speeding, inverted hoist design, a 95 Payhauler dumps its load in only 11 seconds, ready to high-tail back for another load. The lime rock is air dried, then fed to crusher by dozer and dragline to produce road base and stabilizing material.

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Equipment

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A COMPLETE POWER PACKAGE

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The mighty SN 30 ton outperforms all dumpers in its class!

GEORGE WIMPEY & CO. LTD., the largest contracting organisation in Europe are the latest of the many big contractors to use Britain's most powerful dumper the tough Aveling-Barford S.N. 30 Ton. They know that this powerful, ruggedly built machine can handle the heaviest loads under the roughest conditions, with speed and ease. Six forward and one reverse speeds with a top of 30 m.p.h. from its 400 b.h.p. Rolls-Royce turbo charged engine, or 33 m.p.h., with Allison Torqmatic No. CLBT 5940, give it immense power and manoeuvrability. The body stands up to the heaviest punishment from impact loading. The hydraulic tip can be held at any angle.
Full particulars of the 'SN' gladly sent on request.

One of the fleet of Aveling-Barford dumpers operating in Chile for the Compania Minera Santa Fe.

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AVELING-BARFORD LIMITED · GRANTHAM · ENGLAND

EXTRA

"QUICK-WAY" NEWS

EXTRA

2401 East 40th — Denver 1, Colorado

UNIVERSAL MARION BUYS DENVER CRANE, SHOVEL FIRM

Purchase of "Quick-Way" Truck Shovel Company has been announced by James Mullaney, president of Universal Marion Corporation, Jacksonville, Florida.

Mr. Mullaney said the firm will adopt the trade name of "Quick-Way" Crane-Shovel Company, and will operate as a division of Universal Marion Corporation. G. S. Rigdon has been appointed vice president and general manager of the division.

"It is our plan," Mr. Mullaney continued, "to have "Quick-Way" regain as quickly as possible its former position in the shovel industry. To that purpose, Mr. Anthony Colatrino has been placed in charge of sales activities for the corporation for all sizes of machines, from ⅜ cu. yd. through 4 cu. yd., produced by the Marion Power Shovel and "Quick-Way" divisions.

"Mr. Colatrino will be contacting all distributors of Marion and "Quick-Way" as soon as it is practicable. He will also set up regional sales meetings to acquaint all sales representatives with the products of both divisions. Mr. R. G. Herbst will act as Mr. Colatrino's assistant in handling of "Quick-Way" transactions.

"We intend to develop the best possible organization of distributors and sales representatives. We will have at your disposal the most complete lines of machines in the industry and are determined to obtain the highest possible share of the market."

25-ton crane photographed at the "Quick-Way" office building in Denver

Job Flexibility, Wide Choice of Equipment Featured

Cranes, hoes, shovels, draglines, clamshells, log loaders — "Quick-Way" offers them in a variety of sizes.

You can have such features as power booming up and down, power load lowering, third drum, independent travel, remote control, telescoping high gantry — including many as standard equipment.

In the words of A. M. Colatrino, sales manager, "Today's line of "Quick-Way" machines is extremely flexible and adaptable to a wide variety of job problems, and easily convertible in the field for general-purpose work."

He emphasized the variety of front-end equipment available for all 11 "Quick-Way" rubber and crawler-mounted machines, dependable hydraulic control and the use of 8-foot carriers to meet all highway travel requirements as job features important to owners.

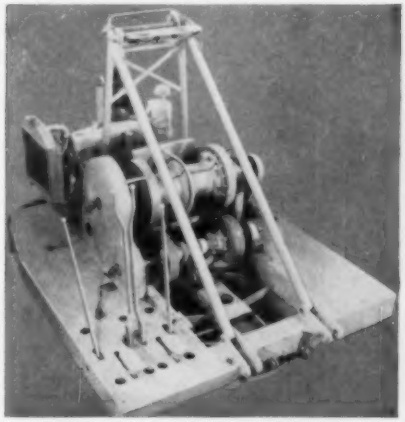
Truck-mounted machines in the "Quick-Way" line range in crane lifting capacity from 8½ to 25 tons, and each model can be equipped for shovel, dragline, clamshell and hoe service in capacities ranging from ⅜ to 1 yard. Tractor-type crawler machines range from ⅜ to ½ yard and 6 to 9 tons.

Quality Emphasized in Machine Design

Today's line of "Quick-Way" machines, the result of a complete re-design program, offers outstanding performance features.

Commenting on them, G. S. Rigdon, "Quick-Way" vice president and general manager said, "Modern design, quality materials and good workmanship make today's "Quick-Way" machines truly impressive."

He pointed to such features as (1) the clean simplicity of design throughout, (2) 360-degree visibility for the operator, (3) easy accessibility of machinery for ease of maintenance, (4) all shafts machined with involute splines for greater strength, (5) all main shafts and drum assemblies mounted in heavy-duty anti-friction bearings, (6) conical hook rollers mounted in anti-friction bearings and (7) extra-heavy electrically welded main frames with integral wing frames.



Typical deck machinery view shows clean simplicity of design

FOR MORE INFORMATION

. . . write, wire or call "Quick-Way" Crane-Shovel Co. 2401 East 40th, Denver 1, Colorado

☐ Truck-mounted cranes, 8½ to 25 tons, easily convertible to shovel, dragline, clamshell and hoe service (⅜ to 1 yard sizes).

☐ Tractor-type crawler mounted machines, 6 to 9 tons, ⅜ to ½ yard.

I am especially interested in the following capacities: _____

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CITY _____ ZONE ____ STATE _____ Telephone _____

SKOOPER*

Ulland Bros. Add Second on 450,000-Yard

One SKOOPER sells another on job that is test of men and machines

Ulland Bros. put their first Koehring® 205 Skooper to work early in 1960 — used it on a variety of jobs in and around Duluth. Then the company was awarded a contract to move some 450,000 yards of dredged sand on the Duluth-Superior Bridge Project.

The job demanded two machines and Ulland set out to determine the most productive and profitable equipment for the contract. Several rubber-tired front-end-loaders were tested. Crawler models were ruled out due to the abrasiveness of the material. The Skooper served as a basis of comparison.

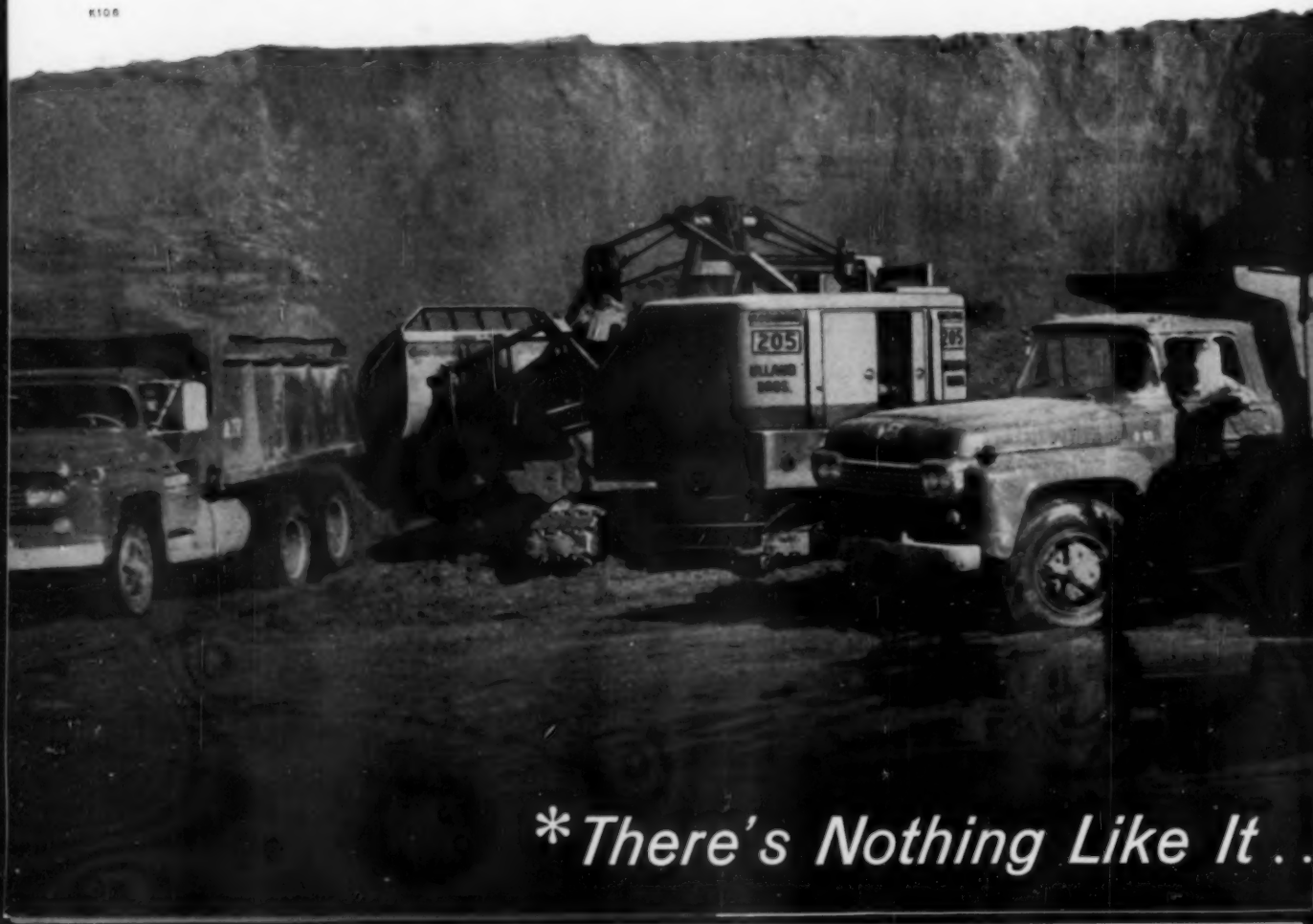
Water draining from the stockpiled material made loading conditions difficult. The de-watered material had a tendency to set-up, pack tight, become extremely tough to dig and move. For every two loads per front-end-loader, the Skooper dug and loaded three . . . put 15 to 16 tons in a truck on the average of 2 to 2¼ minutes. Even under the most adverse conditions the Skooper averaged between 233 and 250 yards an hour over a nine hour shift.

So . . . Ulland bought another Skooper.

Why? The Skooper's standstill dig, swing, dump cycling netted bigger payloads. Its 7-ft. level crowd coupled with its powerful hydraulic break-out force enabled the Skooper to load more — faster — than any comparable machine on the job. The Skooper proved without a doubt — there's nothing like it on wheels or tracks!

You can prove it, too! Put the Skooper through the paces at your nearby distributor. You'll be dollars ahead on your next loading contract.

K106



*There's Nothing Like It . .

IN KANSAS, this 600-cfm Gyro-Flo provides air power for erection

IN TEXAS, three Gyro-Flo 600s power Crawl-IR drills for a missile

SKOOPER*
Sand Fill Job

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DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

. . on Wheels or Tracks!

IN KANSAS, this 600-cfm Gyro-Flo provides air power for erection of a missile silo.

IN TEXAS, three Gyro-Flo 600s power Crawl-IR drills for a missile launching site.

IN NEW YORK, three 600-cfm Gyro-Flo compressors help break ground for a missile pit.

Why missile-base contractors

DEPEND ON GYRO-FLO

The answer is simple. They know Gyro-Flo portable compressors are dependable... give top performance and sustained fuel economy with practically no attention or maintenance.

Where schedules MUST be met, there's no substitute for Gyro-Flo... the first and most experienced portable rotary air compressor, pioneered and perfected by Ingersoll-Rand.

Available in sizes from 85 to 900 cfm, Gyro-Flo compressors provide a constant source of 100 psi air month after month, even under the most adverse conditions of heat or cold. Like cost-conscious contractors everywhere, you too can *depend on Gyro-Flo.*

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the new ESCO ripper point rips where other points fail!

This newly-designed Ripper Point now rips tough material that previously had to be shot.

ESCO CORPORATION,
PORTLAND, OREGON; DANVILLE, ILLINOIS

See other side for more details

ESCO OFFERS YOU A POINT DESIGN AND ALLOY FOR EVERY DIGGING AND RIPPING CONDITION

RIPPER POINT SELECTION

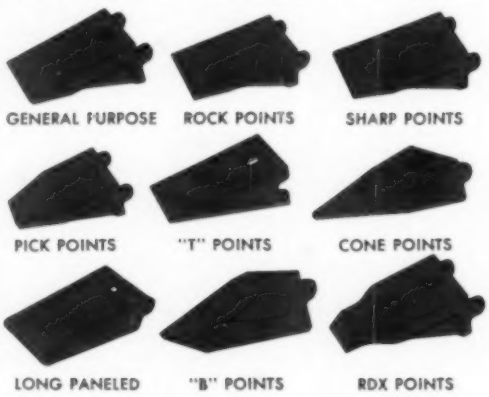
- 14" for previously unrippable material.
- 15" for major penetration problems.
- 16" for tough production ripping.
- 18" for general ripping.
- 20" for easily ripped material.

AVERAGE RIPPER POINT LIFE IN ON-THE-JOB TESTS

	Job No. 1	Job No. 2	Job No. 3	Job No. 4
ESCO Ripper Points	5½ hours	16 hours	4 hours	56 hours
Other Ripper Points (average)	½ hour	2 hours	1½ hours	8 hours

Longer life, superior penetration, increased production—these are the three features of *ESCO*'s new ripper point that mean lower costs for you. You can easily convert all your rippers to *ESCO* points. Ask your local *ESCO* dealer about cast *ESCO* shanks and *ESCO* weld-on nose pieces to convert any shank.

9 POINT TYPES FOR EVERY DIGGING CONDITION



ESCO two-piece teeth, with the widest selection of point shapes in the industry, are tailored to meet your digging requirements. *ESCO* alloy steel is used for high resistance to severe shock and abrasion.

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This exclusive *ESCO* combination of the right design, the right alloy, and the right shape makes *ESCO* two-piece teeth *right* for any digging condition.

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Handling kid-glove stuff like this is what puts the HYDROCRANE in a class by itself. Let your Bucyrus-Erie distributor show you the outstanding job it does on hundreds of jobs. Bucyrus-Erie Company, South Milwaukee, Wisconsin. 5H61

BUCYRUS ERIE®

world's largest manufacturer of cranes and excavators

BIG PERFORMANCE... LOW MAINTENANCE WITH PINNED-DOWN STABILITY

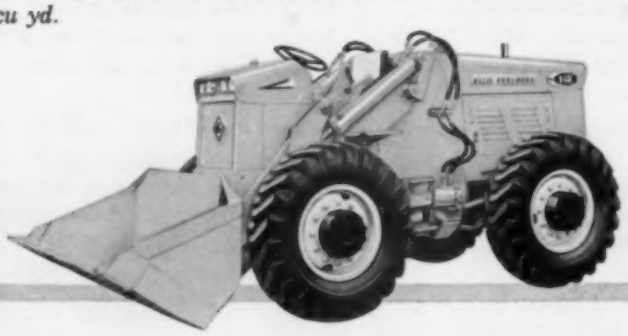
Allis-Chalmers tractor loaders feature axles that are pin-connected to the frame with thick steel pins . . . not automotive-type U-bolt connections. Tractor loaders stay on the job . . . not in the shop.

Pinned-down stability—that's what you get in Allis-Chalmers tractor loaders. Axles on these units are pin-connected to the frame with thick steel pins . . . not lightweight U-bolt connections. There's no rolling or shifting under load . . . no grief with bolts working loose . . . or mounting plates warping out of shape.

Pin-connected axles keep Allis-Chalmers loaders on the job . . . not in the shop. There's far less downtime due to annoying axle problems. You'll also profit from: *extra stability* from a longer wheelbase to length ratio; *single-lever control* of all speed and direction movements; *five-way hydraulic filtering* for safe, efficient operation; *well-located dump cylinders* that are up and away from dirt and *high lift—long reach* for fast, easy loading cycles.

See Allis-Chalmers loaders in action. Be convinced that these units can bring you extra earnings on all excavating and loading work. *Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.*

Allis-Chalmers offers 6 tractor loader models—ranging in power from 76.5 to 184 horsepower—in carry capacity from 3,600 to 10,500 lb and with buckets available from 1 to 6 cu yd.



STEP UP YOUR

Performance
Operator comfort
Wearability
Ease of maintenance
Reliability

WITH **ALLIS-CHALMERS**
POWER FOR A GROWING WORLD

ALLIS-CHALMERS
14

Montana's Biggest Road

DIESEL POWERED shovel is biggest ever used on a Montana road job. High mountains

Broad rock cuts give rotary drill and 5-yd. shovel the chance to show how big-scale roadway excavation is done 1961-style.

IN the Yellowstone Gateway country of southern Montana, construction is highballing on the biggest road contract ever let by the state highway department of Montana.

The 11.3-mile long job is located on the outskirts of the city of Livingston in majestic Paradise Valley, surrounded by high, white-capped mountain ranges.

Contractors are a joint venture of Bud King Construction Co. of Missoula, and McLaughlin, Inc., of Great Falls. Price of the contract is $3,134,000.

The construction will be part of interstate route 90, which in Montana runs from Billings to Missoula, closely paralleling present U. S. route 10. Nationally, I-90 runs from Boston to Seattle.

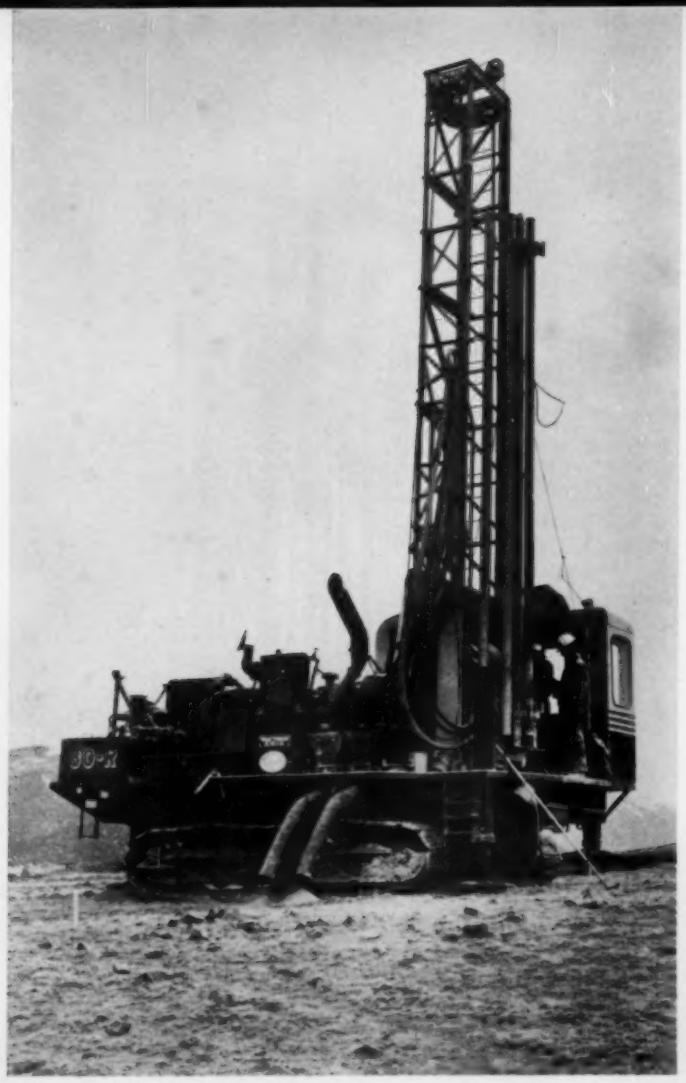
Boon for Tourists

Route 90 will become an excellent route for eastern tourists going to Yellowstone National Park. Tourists leaving I-90 at Livingston will have only a short easy 56-mile drive south along the Yellowstone river to reach Gardiner, Mont., the park's northern entrance.

The job, besides being big, has several "firsts" in Montana highway con-

Job

in background are peaks in the Snow range.



CRAWLER-MOUNTED diesel-driven 30-R rotary blast hole drill drills 6¼-in. diameter holes. King-McLaughlin job is the first application of this drill to highway work.

struction. It has the biggest power shovel—5 cubic yards—ever on a road job in Montana. It also has the first big diameter rotary-type blast hole drill used in the state for drilling roadway excavation.

The King-McLaughlin rock-and-earth moving spread has been going since early spring on the job which has a completion deadline of 350 calendar days. Land clearing began in December 1960. Current work is on a two-shift, six-days-a-week basis.

The contract lists some 3 million yards of unclassified excavation, of which a million yards is expected to be shovel work. About 700,000 yards

CONFERENCE on the job is held by contractor and state highway department personnel. (Left to right) John Clayton, night shift foreman; Bob Tolman, day shift foreman, John Anderson, state project engineer; Dennis Washington, project superintendent; and George Barrett, highway department division engineer.

Average bank drilled is 25 to 30 feet deep, and holes are drilled 5 feet subgrade. Rotary drill uses 21-ft. long drill pipe sections.

Syd Ward, drilling and blasting foreman, loads free-running Orlite nitro-carbo-nitrate pellets into blast hole wired with Primacord.

of the shovel digging will be rock which must be drilled and shot.

The Livingston rock formation consists of decomposed granite, sandstone and shale. It lays in shelves and follows a slight dip.

Most of the rock total must be taken out of a single cut 3,900 feet long which runs 76 feet deep at its maximum point, and averages about 35 feet deep. The cut will put the superhighway through a ridge known locally as Voyich hill.

A typical engineering drawing of the cut shows a bottom width of approximately 150 feet, and 3 on 1 sides on the cut slopes.

The cut is wide, long and moderately deep, much like a quarrying operation. The situation thus calls for high capacity, big production equipment.

King-McLaughlin's answer to the problem comes in the form of a Bucyrus-Erie diesel-powered 88-B shovel matched with a crawler-mounted 30-R rotary blast hole drill. The diesel-driven 30-R drills 6¼-in. diameter holes.

Use of the 88-B marks the first application of a shovel that large to highway work in the state. Largest machines used previously have been in the 2½ to 3-yd. class.

Normally rated at 4 cubic yards, the 88-B carries a 5-yd. Esco dipper with ease. It is powered by a Cummins NVH-12-I diesel engine equipped with Twin Disc single-stage torque converter. Fast-acting air controls make for easy handling of the big machine.

Hauling units serving the loading shovel are two Caterpillar DW21 two-wheel tractors with PR21 Athey wagons and six 9LDT Euclid 4-wheel tractors with modified PR21 Atheys.

Rock loading is a close-sequence operation with timing arranged so that an empty hauler drives in when the shovel finishes a load. Double-spotting of trucks is generally practiced to keep the cycle swing under 90° whenever possible.

Project Superintendent Dennis Washington estimates the big shovel takes about 90 bites with its 5-yd. dipper per hour, or 3,700 yards in an

FRAGMENTATION results of the job's blasting technique show here as well broken rock quickly drops through open door of dipper.

TWENTY-ONE YARDS of rock tumble out on the fill from the body of Athey PR-21 wagon pulled by a two-wheel Cat DW21 tractor.

DUMPED ROCK is dozed by Cat D8 into thin lifts of material. Fill here is a low-lying area along the Yellowstone river.

EMBANKMENT FILL is compacted by Tampo sheepsfoot rollers hooked up in tandem and pulled by a Cat D8.

8-hour shift. It takes less than two minutes to load one of the 20-yd. rock wagons, which hauls its load a mile or more at speeds up to 25 mph.

Esco R6 points with 12H steel are used on the Esco dipper. They are changed every two weeks. To combat abrasion wear from rock loading, Stoody manganese rod is used for hardfacing the dipper lip and body sides. Welders apply the rod a couple of nights a week for a few hours, after the second shift is done.

The haul road from the loading face to the fill is kept patrolled constantly by a Cat No. 12 motor grader. Fine material is hauled and spread on the road periodically to fill spots and level out ruts to give solid footing to the high-speed Athey wagons.

To use the rock quantities to best advantage, the state engineers specified 1,700,000 mile-yards of overhaul of unclassified excavation.

Rock is disposed of in interchange ramps, bridge approaches and other fill areas, with the bigger pieces going in the bottom portion. Breakage is good so that oversize pieces are not a big problem. Finer cover material is brought in by scrapers.

A battery of portable generator light sets illuminate the haul road and fill sites for night shift work. There are two portable Caterpillar 30KW generators and four Kohler 7KW units. The 88-B shovel itself has a 2KW Kohler generator set for its cab lights and floodlights.

Drilling and shooting procedure worked out for the rock formation is an important story in itself, and the key to the job's high production.

Drilling foreman on the job is Syd Ward, an experienced veteran of the Butte mining district. Ward has worked out a hole pattern and loading technique designed to lift the rock with little throw and break it fine for easy loading by the shovel. As the accompanying photographs show, oversize pieces are hard to find.

A single unit handles the whole drilling assignment. The 30-R rotary has had no trouble keeping up with the capacity of the excavator-hauler spread. The drill works two 8-hour shifts daily.

Ward compared the King-McLaughlin job with the typical western road job using wagon drills. Three wagon drills working double shifts would be required to break the same amount of rock yardage the 30-R now handles. Ward himself, and four men, handle the entire drilling and loading setup. Three men are doing the work of the 10 or 12 that would be needed to man the wagon drills. In addition, rock dust is almost eliminated because the 30-R has a Roto-Clone unit that sucks up fines and dust.

Two important factors make the 30-R handle its assignment fast and efficiently. 1) It bores a large 6¼-in. diameter hole that can hold a tremendous amount of explosive. 2) It is a high speed drill in medium and medium-hard formations.

Large-Diameter Technique

The job shows that it is far more economical to drill large-diameter holes on greater centers than small holes at close spacing. The volume of any hole varies as the square of its diameter. So, a 6¼-in. diameter hole will have more than four times the capacity of a 3-in. hole. Drilled on 12 or 15-ft. centers, the 6¼-in. holes will break a heavier burden of rock with less powder.

The rotary drill applies the principle of great down pressure combined with moderate rotating bit speed to achieve a fast cutting action. A Hughes model H Tricone drill bit is used.

The drill pipe sections come in lengths of 21 feet. They are stored in a "lazy susan" type storage rack that has a capacity of five lengths of pipe. The rack automatically swings the pipes into position above the hole.

Thorough cuts, which generally do not exceed 25 to 50-ft. depths, are drilled all the way in a single operation, and then blasted. Broken rock is dug in about 20-ft. high lifts by the 88-B shovel.

Drill holes extend about five feet subgrade in order to have uniform breakage down to the desired elevation.

Hole production on this job runs about 600 feet per drilling shift of 8 hours. Allowing two drill steels for a 35-ft. depth, the 30-R puts down 1¼ feet of hole per minute. This also includes move-up time.

Bit life is variable depending on

the hardness of the material drilled. Generally, they are discarded because of bearing failures rather than wear on the cutting edges. Ward estimates that in hard rock drilling, bits have a useful life of 1,300 feet, and in soft rock up to 3,000 feet.

Loading factor for the type of rock encountered on the job runs ¾-lb. of powder per yard of rock broken.

The large diameter holes are primed with Primacord attached to a single stick of 2 x 12-in. Super A-3 dynamite placed in the bottom of the hole. The bottom half of the hole is then filled with free-running explosive. Bags of 50 pounds of Orlite—premixed nitro-carbo-nitrate pellets made by Olin Mathieson Chemical Corp.—are emptied into the hole. Stemming material then is added to collar of the hole.

Instantaneous firing with Primacord works out satisfactorily on the job.

Several large thorough cuts in soft material, suitable for scraper loading, will provide material for embankments and for the production of aggregates.

When *Excavating Engineer* photographed the job, a prewetting technique of conditioning borrow material

FLOODLIGHTING for the haul road is provided by this mobile Cat 30KW light plant powered by a Cat D315 diesel.

BAILING OF ROCK from a big thorough cut continues far into the night. Contractor runs two shifts six days a week.

was being applied to a large 400,-000-yd. cut on the east end of the job, and several smaller ones. The cut material is a mixture of gravel and clay. Gravel will be processed for use in base courses and paving of the new roadway. The contract calls for about a million tons of crushed stone for these items.

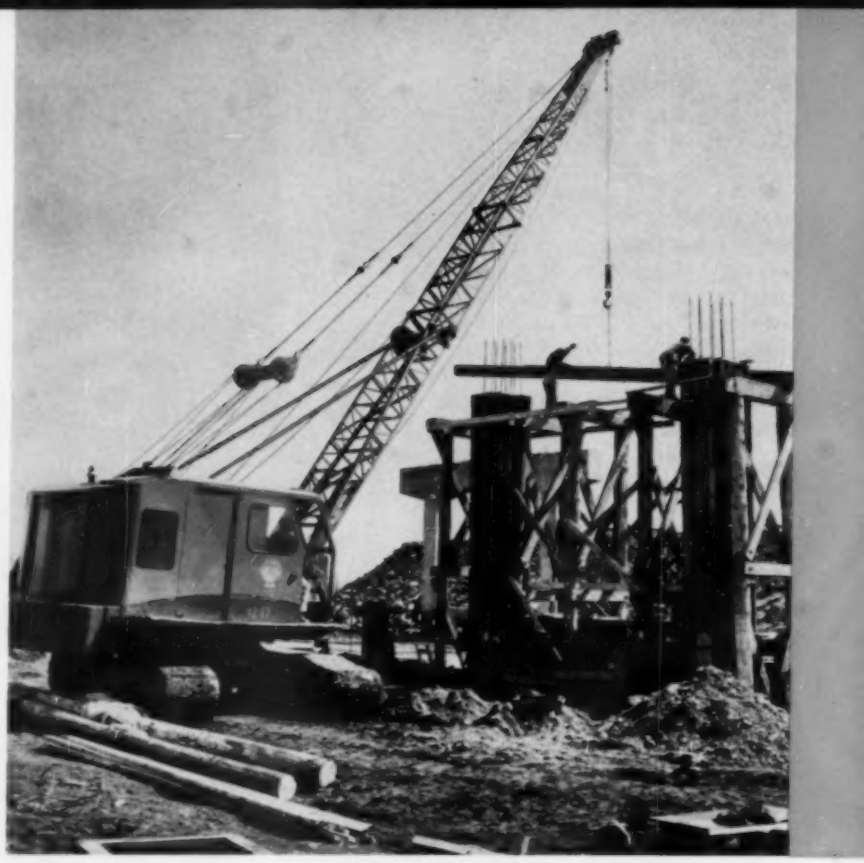
Optimum moisture content of the clay to be used as embankment material is calculated at 14%. To bring the bank material up to this percentage, state highway department engineers figured it had to be saturated by some 19 million gallons of water.

Long rows of pipe cover the cut areas. The contractor has brought lightweight aluminum pipelines, quick couplings and sprinkler-type irrigation heads into the borrow pits and cuts. Moisture is then delivered to the material on a controlled basis.

There are 4,500 feet of 6-in. diameter header line and 2,800 feet of 3-in. laterals. The Rainbird sprinkler heads cover a radius of about 25 feet. Water pressure from nearby creeks and rivers is developed by two 4-in. diameter Gorman-Rupp centrifugal pumps and one 6-in. CMC model.

About 100 sprinkler heads are placed on a section and operate under 45-psi pressure. Average rate of penetration is about one foot per 8 hours of artificial rainfall, with a pump input of 570 gallons per minute. To penetrate a 50-ft. depth of the cut, the sprinklers must work about 400 hours.

When the right amount of water has been sprinkled and the water penetrates to proper depth, the sprinklers are shut off and the system is moved in a few hours time to the next location.



STRUCTURAL CONTRACTOR Schultz & Lindsay uses this Koehring 405 crane to erect forms for interchange bridge columns and caps.

The prewetted cuts are being graded and borrow loaded by four Cat D8-No. 90 tractor-scrapers that haul 27 cubic yards, and six DW21's. Pushloading is done with Cat D9 and D8 dozers. After the material is dumped in fill areas, three Tampo sheepsfoot rollers pulled by D8's compact the material in 8-in. lifts.

The process uses less water than conventional sprinkler trucks would require. Whatever surface evaporation occurs is replenished between lifts by water wagons. Three wagons of 5,300, 4,200 and 3,500-gallon tank capacities are used.

The $3,134,000 King-McLaughlin contract calls for a complete grading, drainage and paving package, except for structures. Two interchange areas and twin 700-ft. bridges across the Yellowstone river are being built under two separate contracts which total $1,136,000. Schultz & Lindsay Construction Co., of Fargo, N. D., is building the interchange bridges. Cahoon Construction Co., of Pocatello, Idaho, is erecting the river bridges.

DIRTMOVING subcontractor on the King-McLaughlin contract is Dillsworth Construction Co., of Helena. Owner William Dillsworth is shown here with his son, Hugo, grade foreman.

UTILITY EXCAVATOR on the job is a Lima ¾-yd. Paymaster dragline. Here it is digging a ditch for culvert pipe.

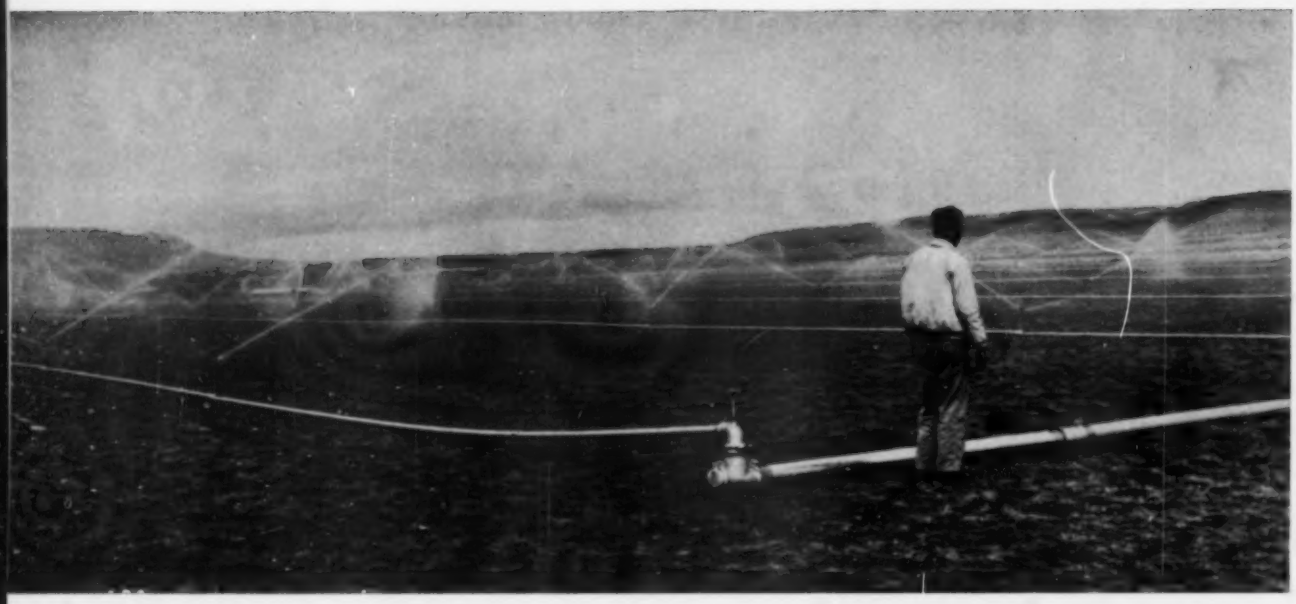
UPPER PORTIONS of cuts, containing less consolidated rock formations, are ripped by a D9 on which is rear-mounted a Caterpillar No. 9 hydraulic ripper blade.

A portion of the 3 million-yd. total excavation has been subcontracted to William Dillsworth of Helena, Mont. Dillsworth will move 400,000 yards of dirt on the east end of the job with seven Cat DW21-No. 470 tractor-scraper units that haul 21 cubic yards.

The roadway will consist of a pair of divided highways, each with 24-ft. travel widths and 10-ft. shoulders. A 36-ft. median strip will separate the opposing lanes of traffic. Base for the travel widths will be 12 inches of selected surfacing; 6 inches of

(Continued on next page)

STARTING DOWN the haul road is a Cat DW21-No. 470 tractor scraper which has just panned a load of ripped rock into its bowl.



Prewetting technique of conditioning borrow material is applied to this large cut area. Aluminum 6-in. header lines feed 3-in. laterals.

crushed base surfacing; 2 inches of crushed top surfacing; and 4 inches of bituminous plant mix laid down in two lifts.

Paving quantities are as follows: 565,365 tons selected 4-in. surfacing; 236,317 tons Type A 2-in. crushed base surfacing; 65,717 tons Type A ¾-in. crushed top surfacing; 124,624 tons plant mix bituminous surfacing Type II.

Natural Combination

Bud King has one of the largest earthmoving spreads in the state. McLaughlin has a big spread of paving equipment.

The joint venture, therefore, is a natural combination for efficient handling of the big contract items of this interstate project.

Hauling equipment for all of the laying of the crushed stone base courses includes six Euclid 9LDT 28-yd. belly-dump wagons; 10 model 9FTD belly-dumps; and 10 Ford F750 dump trucks. A 200-tph Pioneer hot plant will supply the mix for the bituminous paving.

Bud King founded his company 15 years ago in Missoula. Highways and earthfill dams are the chief types of work on which the firm bids. It currently has underway two large earthfill dams for the Bureau of Reclamation—both in Colorado.

The job headquarters is located on the outskirts of town. It consists of an administrative office with living quarters for the job super and office manager. There is also a centralized lube storage setup; tire service station; trailer-mounted parts and materials center; and a double-bay heavy equipment repair shop.

For the contractors, Dennis Washington runs the excavation show as project superintendent. Contractor Bud King makes periodic calls on the job, flying to the site in his personal four-passenger Cessna 210 plane. Red Muir, vice president of McLaughlin, Inc., calls on the job regularly also.

Washington is assisted by Bob Tolman, day foreman; John Clayton, night shift foreman; Stan Horelec, master mechanic; and Syd Ward, drilling and blasting foreman. R. L. Anderson is office manager.

The project is under the general direction of Fred Quinnell, Jr., state highway engineer. George Barrett is division engineer of the Bozeman area where the job is located, and John Anderson is project engineer in charge of construction.

Water pressure from nearby creek is developed by a 6-in. diameter CMC centrifugal pump powered by Chrysler Industrial engine.

PROTECT PROFIT MARGINS WITH HENDRIX DRAGLINE BUCKETS - ENGINEERED DESIGNED AND BUILT FOR GREATER PRODUCTION AT THE LOWEST COST-PER-YARD

Hendrix Lightweight DRAGLINE BUCKETS

"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards - Perforated or Solid

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

CUTTER BLADE, viewed from rear quarter, scribes fairly deep mark in plant-mixed asphalt street surfacing.

Easier Street Pavement Excavation

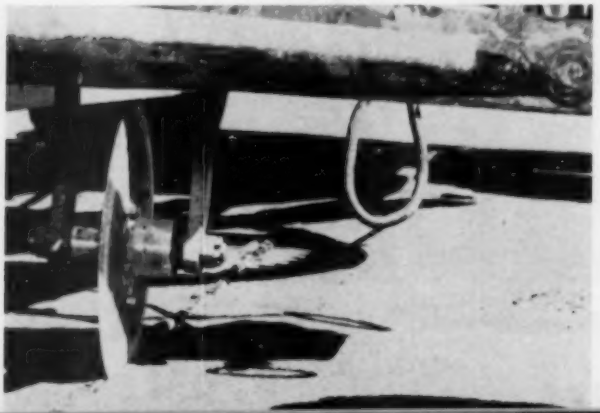
New device mountable on a motor grader cuts hard asphaltic concrete neatly at a fast clip. Public works official in Mesa, Ariz., tells how it works.

NEAR-INDESTRUCTIBLE is the word for a device that's revolutionizing utility line relocations in the city of Mesa, Ariz. The new tool is an asphalt cutting wheel which mounts either on the scarifier frame or moldboard of a motor grader, on the frame of a trenching machine, on a dozer, or on many other types of construction machinery.

Mesa's Street Supervisor Otis Redd says the new method has these advantages:

1) It will cut hard asphaltic con-

FRONT VIEW of cutter blade shows how it is mounted on motor grader's scarifier frame; makes neat trench cut.



crete at rates averaging 500 feet per hour for a 4-in. cake. That's a tremendous advancement over past methods.

2) Because the wheel rotates, it escapes a lot of abrasion punishment. It's heat treated, of course, but its service life is remarkable.

3) The wheel exerts down pressure on the pavement as it does its work. In this respect, it's an improvement over methods which ravel and spall, or actually lift the pavement loose from the sub-base. Redd pointed out that this actually happened when they used sharpened ripper shanks to slice through the asphalt.

4) When a ditch is ready for pavement restoration, a neat cut with smooth edges takes less hot mix. It's an important factor these days, when wasted tons of asphalt mean wasted public dollars.

Manufactured in Denver, Colo., by Specialty Mfg. Co., the city of Mesa's asphalt cutter is mounted on the scarifier frame of a Cat No. 12 motor grader. The wheel was bought when a flurry of water-main relocations showed up.

Mesa is faced with the same problems in this respect which beset any city of comparable size. The city's 35,000 people travel over a 100-mile system of permanently paved asphaltic hot-mix streets. In addition, 27 miles are paved but are currently not finished with curb and gutter. Some 12 miles are unimproved, but it's safe to predict that this mileage soon will be paved. Relocations of utilities are under way somewhere on this street system almost daily, to serve newly-built housing areas. So some better method of pavement cutting was in great demand.

After just a shift or two of trial and experimentation, a satisfactory method was settled on for using the new tool. First, the exact width of trench is marked off on the surface of the pavement. A red or yellow carpenter's chalk line is used for that purpose. With the asphalt cutting wheel mounted in such a way that it doesn't unscrew its mounting bolts when it socks in full depth, the motor grader operator first scribes a small mark, using very little down pressure. It makes a surface groove only ¼-in. deep. This guide slot then serves to hold the wheel on a straight course on the second pass, when much greater down pressure is exerted. Usually only three trips are necessary to cut through 3½-in. slab, even when a stiff asphalt cement was used for the pavement mix.

For trenches two feet wide or under, all that's necessary is to cut each edge. The pavement will then lift out easily. Where the asphalt is to be wasted, anyway, or when the trench is wider, it helps to make additional cuts. For example, when these pictures were made by *Excavating Engineer*, a 3-ft. wide trench was being excavated. In that case, both sides and the center were cut by the new tool.

After the pavement cuts are made, trenching machines or other excavation tools do their work about the same as they always did. The same motor grader which does the cutting has time to help on backfill. Redd likes to keep his operation finished up tight in a short distance, for safety's sake.

Working quietly and fast, the new cutter permits Mesa's utilities department to relocate lines with such little noise or nuisance that John Q. Public seldom notices or complains.

ASPHALT-CUTTER equipped Cat motor grader moves into position to open the excavation.

CLEANUP is being made here by a Ford-mounted Wagner front-end loader.

NEAT, STRAIGHT trench sides show here. Previous method of ripping with sharpened ripper shanks shows in background.

MESA CITY equipment was strung out on a water-line restoration when this picture was made. Ford 801 Powermaster has just excavated a stub trench.

PLENTIFUL WATER that floods the Bonsal pit is a mixed blessing. Although it makes digging tougher for the draglines (like the Bucyrus-Erie 71-B here), it also helps separate sand from the gravel at the screening plant.

new markets spur quarry's growth

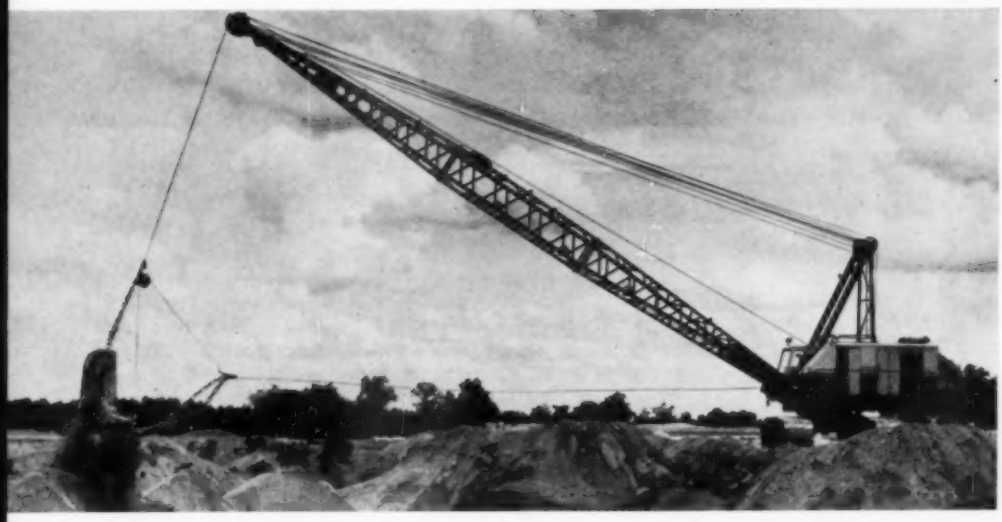
OLD quarries need never die—not if they search out new markets for their output. That credo has kept W. R. Bonsal Co., Lilesville, N. C., alive and thriving through five decades. But success here rests on more than a big sales pitch. Smart ideas that coax extra tonnage from the pit and screening plant also help build volume and cut overhead.

Selective digging, for instance. This gives the draglines a chance to more-or-less tailor the pit-run material for most efficient plant operation. Another profit-maker: a job-designed unit that recovers almost all sand from the plant's rinse water. Thanks to gimmicks like these, output of the old plant has kept pace with growing demand. At present, the plant turns out 400 tons per hour, and sells every ounce of it.

What's the secret? Well, give a lot of credit to company foresight in jumping the fences that limit growth

Active search for new customers afield, and close watch on overhead costs at home, keep the growth curve aimed upward for the Bonsal Co., North Carolina sand and gravel producer.

JACK-OF-ALL-JOBS around the plant, this Wagner Scoopmobile also pitches in to help load out trucks during rush periods.



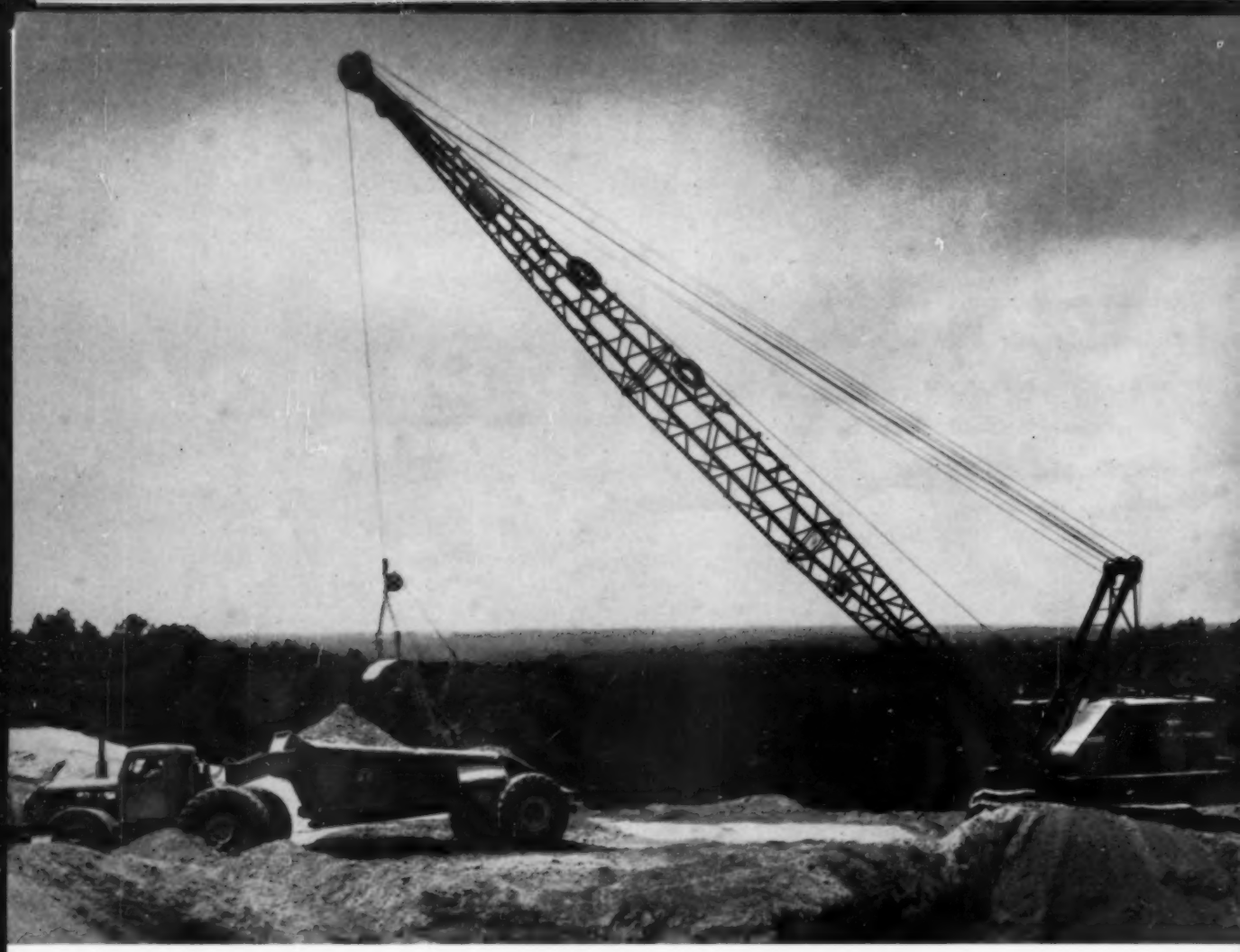
LONG REACH of this dragline makes it easy for the operator to hit the mark as he casts overburden on the spoil pile. This rig wields a 3-yd. Bucyrus-Erie bucket on its 85-ft. stick.

of many sand and gravel outfits. Sure, the rambling pit near Lilesville still serves the whole gamut of usual patrons—home-builders to highway departments. In addition, it now ships aggregates to Bonsal plants that make "packaged" concrete for suburbanites, and hollow-core beams for builders. To top off the list, the quarry also supplies valuable compounds with end uses far removed from the normal gravel market—in metals, and in some of today's hottest household items, for instance.

Bonsal's production story gets off to a good start right at the digging face. There, in a scene strongly resembling a moonscape from a science-fiction movie, two draglines load out a string of Euc wagons.

Why draglines? You can't beat them for fast, cheap mining of the flooded deposits here. The rich lode of commercial grade high-quartzite gravel and river sand runs up to 70 feet deep. However, with the water table just 20 feet below ground, most of the digging is tough and wet—yet still a snap for draglines, which work up in the dry.

Why two draglines? The better to chase down patches and pockets of gravel scattered over the 1,000-acre pit site. While it might be unwise to move a giant dragline several times a day to get at scattered deposits, the



EUCLID BELLY-DUMP wagon carries away a 16-yd. payload loaded by this 2½-yd. 54-B. The 71-B and 54-B load out about 3,000 yards of sand and gravel daily.

smaller rigs take well to their dig-and-run role.

There's another big bonus with two machines. It's the ability to balance plant input to screen capacity and market demand. Mother Nature laid down a patchwork of strata in these bottom-lands. The random deposits pose a serious digging problem. In one spot the dragline digs mostly sand. Nearby, a deep pocket high in gravel content crops up.

You can see how it would hobble plant output, which is now geared for 50% sand and 50% gravel, if the pit-run feed leaned too far in either direction. So Bonsal needs the two draglines to mine separate spots for the right proportion of sand to gravel, and the right balance of gravel sizes.

The draglines—a 2½-yd. Bucyrus-Erie 54-B and a 3-yd. 71-B—load out about 3,000 cubic yards total each day. They strip before they dig, pulling out and casting back a layer of overburden that varies from just a scattering of topsoil to a 25-ft. thick blanket of earth.

The 54-B also earns its keep on the extensive earth handling needed for water control in the pit. The task shapes up as a running battle to keep the ground water from escaping—some 5,000 gallons per minute are needed at the plant alone. So the 54-B opens drainage ditches, helps string pipe, and throws earth revetments that seal off natural outflow channels.

On the 3-mile round-trip haul from pit to plant, eight Euclid belly-dump wagons clock cycle times averaging a scant 10 minutes. First-class haul roads (where the Eucs open up fast to top 35-mph speed) help hold down cycle time. Fast loading is also a factor. The wide-open top of the wagon makes for easy bulls-eye loading, even with the big dragline bucket.

At the plant, the wagons dump "on the run" into a pass-over feed hopper. Then, to put it simply, wet vibrating screens wash out all the sand so the gravel can be sized and stored. A separate unit then reclaims the sand from the wash water.

The plant hugs the side of a hill like a sprawling vine with broad steel tendrils. At the top, the Eucs chute in their loads. At the base, rail hopper cars take aboard cargoes of gleaming white sand and shiny gravel. Here's what happens in between:

The pit-run material drops into an Allis-Chalmers pan-type feeder, which meters the flow onto a 30-in. conveyor belt. The stream of rock and sand falls onto a Tyler Ty-Rock 5 x 12-ft. double-deck vibrating screen. No effort here to size the gravel. The idea of the two-deck screen is to spread out the gravel so the wash water (flowing from an overhead spray bar) gets plenty of chance to hit the material. The dirty water flows into a collecting flume that drops to the sand section of the plant.

After its primary wash-down, the gravel gets a real scrubbing. A belt chutes the material into an Allis-Chalmers rotary washer where it tumbles and turns in a whirling tempest of water. Then the gravel goes other wash screen—this time a Ty-Rock 4 x 10-ft. double-decker. The wash water from here also goes to the collecting flume. The gravel rides a 36-in. wide belt past an inspection station. There a worker picks off any foreign matter (timber, cans, tramp iron).

The gravel finally cascades on to an Allis-Chalmers Lo-Head triple-deck finish screen. This splits the material into specification sizes, each going to its own storage bin. The breakdown is: Bin 1—plus 1⅛-in.; bin 2—1⅛ to $^{13}/_{16}$-in.; bin 3—$^{13}/_{16}$ to ½-in.; and bin 4—½-in. to No. 4 screen size.

To fill a gravel order, the operator opens the gate under one or more of the bins (blending the flow to make just the right "prescription"). The

TALL TOWER that supports this belt should look familiar to old-time excavating men. It's the boom of a steam dragline that went to the scrap heap many years ago.

SERIES OF TANKS slows down the flow of water so all the sand can settle out. Sand screws at the bottom then pull the material out of the water.

RINSING SCREEN sits atop the twin hoppers that load gravel into rail cars. Flume carries the wash water to a sand recovery plant.

to a Telsmith 5 x 12-ft. double-deck screen for another gentle bath. Again, the wash water runs into the collecting flume. The cleaned gravel rides a 24-in. belt to the raw surge pile, where it is stored for secondary treatment. The surge pile is a big safety factor if the flow of raw material is ever choked off temporarily. It keeps plenty of gravel on hand to run the plant for a couple of days.

As it is needed, gravel from the surge pile drops onto a 24-in. belt in a reclaiming tunnel. Destination: anstone rides a belt that runs under all the bins, then up to a Ty-Rock rinsing screen. From here it drops into loading hoppers that span the rail spur and truck driveway.

Action on the sand side of the plant is nothing like the shaking, churning turmoil that gets the gravel clean. The idea here is to quiet the water as much as possible, to slow down the flow so the sand settles out for easy recovery. Bonsal's plant men are justly proud of the set-up they devised to do the job—a series

Veteran Digger On Standby Duty

IDLE now, but yet not retired, a veteran dragline waits forlornly in a corner of the Bonsal acreage. It makes a striking picture, this Bucyrus-Erie Class 24 steamer, standing foursquare in the midst of the sandy wasteland it created. Its bucket hangs from the sturdy boom, seemingly poised for another long digging sweep.

Which could very well be, for this rig is no rusting bucket of bolts. Stoke up the boiler, put a muscle man at the long iron control levers, and then watch the dirt fly from the 4-yd. bucket.

Up to a year ago, the dragline carried its weight along with the other excavators in the pit. What finally sidelined it was the rig's solid build. To move the dragline forward, the operator had to plant the bucket out front, then pull the gawky machine along on timber rollers placed under its base. With travel costs figured at nearly a dollar a foot, it just didn't pay to keep old "24" in service.

of big tanks that really wring every grain of sand out of the torrent of wash water.

The flow first enters an 8 x 8-ft. settling tank that catches some of the big-size particles. Material collected here drops into an Eagle sand screw which extracts it from the water.

Overflow from the first tank splits to go into two adjacent 8 x 8-ft. settling basins. Again, the sand drops into a screw chamber beneath, and the overflow pours gently into an 8 x 32-ft. scalping tank. By now the bulk of the sand has been salvaged, but Bonsal isn't satisfied. They go after the rest with a settling system that gets almost 100% recovery.

The set-up consists of yet another 8 x 32-ft. settling tank that takes the overflow of the scalping tank. Silt that settles at the bottom of this unit is almost too fine to handle with sand screws. So a pump forces the slurry into a Dorrclone degritting chamber. Here gentle spiral flow of the water settles out the finest particles.

In its early years, the plant ground out standard products for standard uses: gravels for concrete aggregate, for filter beds, and for road base; sand for mortar and for water plant filters. Carloads of this material still pull out every day, with bills of lading for places all the way from Canada to Florida.

But discovery that the deposit assayed high in quartzite put a different light on the market picture. The rock is widely used in the metal trades, and is a prime source of silicone, the wonder-working chemical that goes into polishes, waterproofing, and rubber-like plastic. Bonsal now sells 30% of its gravel to the metallurgical trade—and the figure grows larger all the time.

More recently, the quarry started shipping concrete aggregates to Bonsal plants that make specialty products. One of these is a favorite "instant" on the home-owner's shopping list—SAKRETE®. (All you do is add water to the contents of the bag. Like magic, you have concrete for that driveway patch, backyard barbeque, or any like do-it-yourself project.) Bonsal also makes Flexicore beams—hollow slabs of concrete that form the floor or roof of a building as fast as your crew can lay them.

What's ahead for the Lilesville quarry? A plenty bright future, according to Supt. Fayette Cloud, Jr. Down on the crystal ball he sees a brand-new plant, fully automated and ready to serve as many new markets as the company can find.

BUILDING STOCKPILES high and wide, a Northwest crane clamshells sand from the end of the plant conveyor. It is assisted by the rubber-tired Wagner Scoopmobile.

SOAKING SPRAY of water hits the gravel as it crosses the vibrating screen. Electric motors power the screens, conveyors and pumps at the plant.

KEMI RIVER HYDROELECTRIC PROJECT IN FINLAND

Near the Arctic Circle, one of two Marion 7400's is now digging the outlet channel which regulates the lake. Some 6 million cubic meters (7,848,000 cubic yards) of earth and rock will be removed when the channel is completed in 1963. The Marion has been working since September, 1958, averaging 80,000 cubic meters a month (104,640 cubic yards). The work is being performed both under water and on the surface behind temporary dams.

CHAMBAL RIVER POWER AND IRRIGATION PROJECT IN INDIA

The multi-purpose Chambal project consists of a dam, power station and 352 miles of irrigation canals. Working on opposite banks to help speed canal construction were two Marion 7200's. The two Marions excavated an average of 700 cubic yards of earth an hour. On completion of the canals in 1960, the Marions were moved to a virgin saddle cut farther down the canal.

WIDENING THE SUEZ CANAL

Two Marion 7400's working on the same bank are widening the Suez Canal.

WALKING TO WORK → ALL OVER THE WORLD

In the last 20 years Marion Walking Draglines have gone to work on five continents, in 14 different countries, in two provinces of Canada, and in 21 states in the U.S.A. In the last three years alone, 25 Marion Walkers, including four of the largest in the world, have been shipped to places as widely separated as Finland, India and Brazil. And Marion is currently working on a "super-giant," a Walking Dragline with an 85-cubic yard bucket and a 275-foot boom.

Marion Walkers have proved their ability on big construction projects, in quarries and gravel plants, and in bauxite, gold and coal mines.

A total of 48 of these Marions have earned their keep on tough jobs outside the U.S.A., where ruggedness and reliability are particularly important because of the parts and service problems imposed by distance.

On their past record, and on their present performance, Marion Walking Draglines can be counted on to give you sustained production at low operating and maintenance costs. They prove it daily, as they literally walk to work all over the world!

You get MORE *with* MARION

MARION POWER SHOVEL CO., MARION, OHIO, U.S.A.

A Division of Universal Marion Corporation

Construction Shortcuts Trim Tollway's Timetable

Part II of a series of four articles.

Contractors come up with some smart ways to make up lost time fast after Mother Nature clamps the lid on work along Miami's 36th Street tollway spur.

VIBRATORY ROLLER gets quick compaction of sandy fill on Capeletti Brothers contract section. An International TD-6 tractor tows the Terrapac unit.

WITH a note of pride in his voice, the job super on one of the Miami tollway contracts points out that his men clipped almost two months off the scheduled 12-month completion time for the job. Then he throws in the punch line:

"That even includes six weeks out for some of the rainiest weather ever seen in these parts. All that, and hurricane Donna too!"

With just minor changes in the script, that is the report you hear from top field brass on the other three contract sections along the 3.7-mile tollway spur. Work is way ahead of schedule despite weather woes and some subsoil surprises nobody expected.

Of course, the rosy progress reports make good reading for Dade county authorities. They have a $25 million bond issue, marketed a couple of years ago, to worry about. The sooner traffic rolls, the sooner they rake in tolls to help pay off the borrowed construction funds.

The same money-in-the-bank attitude infects the contractors. They know the job timetable is tight. They simply set out to beat it. Good machines help. And when it takes a bright idea to solve an odd-ball job problem, well, they brainstorm that too.

Let Don Lloyd clue you on how the dirtmovers caught up fast after a sloppy start. The contract section he ramrods—a 0.9-mile stretch won

TRIMMING SLOPES on a bridge abutment, an International TD-6 tractor takes the steep grade in stride. Compact crawler, working on Reed Construction Corp. section, also works in close around pier footings.

by R. H. Wright, Inc.—started out with a 10,000-cu. yd. item for subsoil excavation. Test borings spotted this pocket of unsuitable soil straddling the right-of-way.

The borings missed completely a couple of other areas that skyrocketed the excavation to a 40,000-cu. yd. total. There was a muck area that showed up when dozers started to clear the route. Then came the big surprise. Diggers turned up some coconut husks. Not just a few either. The final count showed 15,000 cubic yards of husks in the buried rock pit.

"Must have been a dump for an old coconut factory," Lloyd mused as he brought in extra draglines to clear out the soggy mess.

The draglines proved ideal for the mucking work. They swung long booms that reached the deepest deposits while the rig itself stood high and dry. The same long booms put the truck loading area on solid ground, so haul units saved minutes on each trip to the spoil area.

Backfill came from the dredged sand stockpiles in Biscayne Bay. By the time the muck pockets were filled and the overpass approaches and ramps were built, the truck fleet had hauled in 250,000 cubic yards of sand. Dozers spread the borrow in 8-in. layers.

Wright and the other contractors on the tollway used small dozers—Cat D6's and International TD-6's—for better dirt handling. The compact crawlers easily kept the borrow leveled as fast as the trucks dumped it. The small tractors were also nimble enough to take over fine-grading of steep embankment slopes, and to squeeze into tight spaces around bridge footings and drainage pipes. Reed Construction Corp., contractor on the Le Jeune Road interchange, used a Gradall for close-quarters digging and touch-up grading—jobs that once required many hours of costly hand labor.

Open-Face Rollers

The borrow is sandy and dry. Almost all the 15% moisture content must be added on the job. Tank trucks sprinkle in the water. Then a weighted grid roller makes a couple of passes over the fill. The open-face roller chops up soil lumps and helps key together successive lifts.

Final compaction (the specs call for 100% density) became a matter of contractor's choice. R. H. Wright found pneumatic-tired traffic rollers got fast results. On other sections, vibratory compaction built up spec densities in one or two passes over the thin lifts. Capeletti Bros., for instance, used a Terrapac roller behind an International TD-6 crawler tractor. The vibratory unit covered an 8-ft. wide swath at each pass.

Hard-rock subsoil profile brought out heavy-duty pile hammers all along the tollway. Diesel hammers dominated the scene. These units

HOME MADE punch built by Reed Construction Corp. crews smashes open pilot holes to speed pile-setting work. Crane lifts the punch about 6 feet high, then drops it in the pilot hole.

thrive on tough driving conditions. The harder the going, the more punch they deliver.

Heavy Constructors, subbing bridge work on the R. H. Wright section, put this diesel driving power to good use. Coral and limestone outcrops reached almost to ground level. But piles had to go down 40 feet to assure solid footing for overpass bridges.

A McKiernan-Terry DE-40 hammer, swung by a Bucyrus-Erie 38-B crane, socked the 18-in. square piles home fast. Even in tough driving, the crew set and sank nine piles a day. It took a lot of fast juggling by the crane.

As soon as one pile was punched in to 40-ton bearing, the crane yanked up the steel leads and swung around to face the stockpile area. The men hooked a load line on a new pile. Carefully, the crane operator snaked the heavy stick up and into the leads. The 90-ft. boom left plenty of room to keep the pile and leads clear off the ground.

Then the 38-B swung back to the footing hole and the foreman lined up and plumbed the pile. A worker clambered aloft to guide the hammer's bonnet onto the pile top.

At a high-sign from the foreman, the crane operator triggered the hammer. There was a sharp bark and a puff of oily smoke. The pile sank in half a foot. Now the hammer took up a solid beat, its driving ram powered by the explosion of diesel fuel in the cylinder. The men measured progress of the pile as the painted tick marks sank out of sight in the ground. The goal: Drive the pile to refusal—anything over 36 blows per foot of advance.

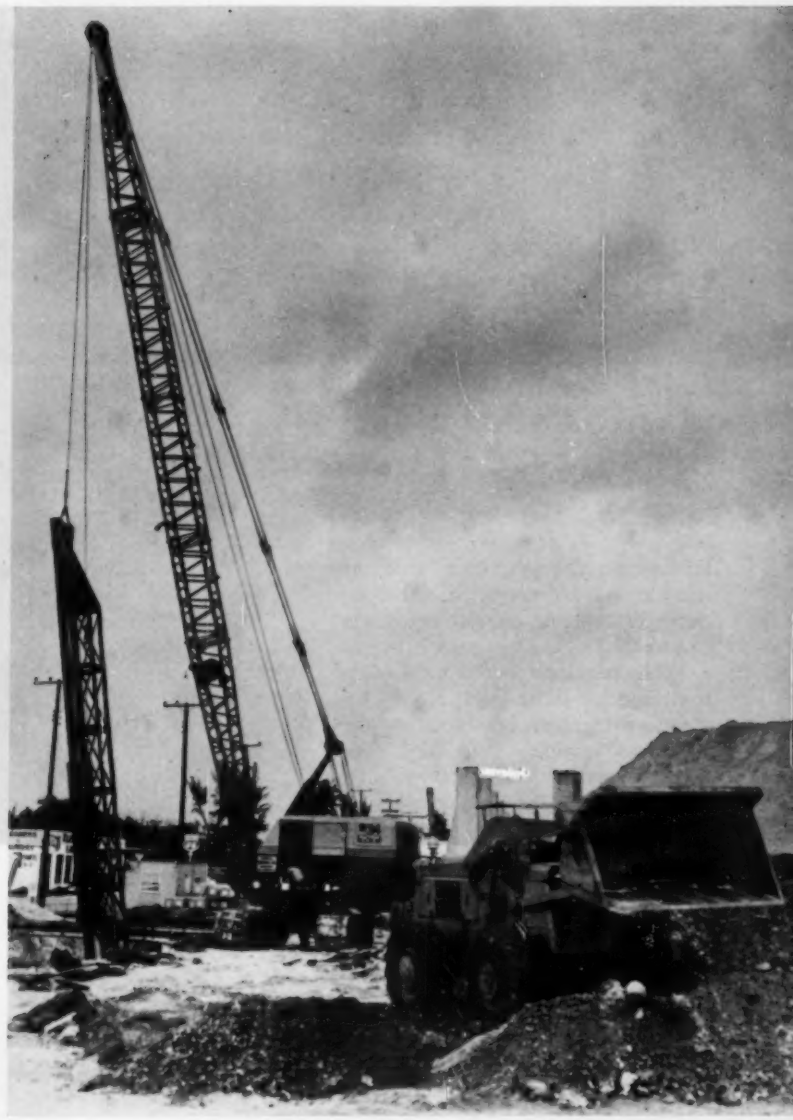
Reed Construction Corp. had long pile problems on their bridge abutments. The future abutment would rest on forty feet of fill and required 15-ton 85-ft. piles 18 inches square to reach to bedrock. The Northwest model 6 crane would handle the piles, but how about driving 85-ft. piles with a 14-ft. long hammer with only 70-feet of leads?

A giant version of the familiar mason's star drill turned the trick. The solid steel tool hangs from the end of a crane line. The operator raises the punch about six feet and lets it drop. Chunk, sharp fins chip open a ragged circle in the hard rock and soil. A dozen times more the tool goes up, crashes down. Soon a clean hole is cut 25 to 30 feet deep.

From here on it is a cinch. The crane sets a lofty pile in the punched hole. Packed earth holds the pile in position as Reed's men rig the leads and hammer. A Link-Belt Speeder 520 diesel hammer delivering eighty 15-ton blows per minute socks the pile home, and they're ready for the next one.

Milt Chapman, Reed's superin-

BATTER PILE poses no problems for the free-swinging leads that guide this McKiernan-Terry DE-40 diesel hammer. Crew drives nine piles a day 40 feet into stubborn coral subsoil.



CRANE DRIVES an 18-in. square pile, while a Michigan tractor-shovel brings in fill material for the bridge ramp.

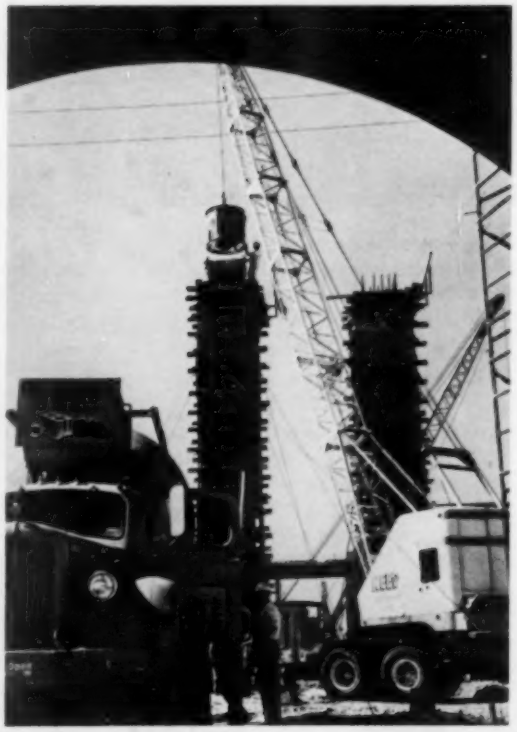
DRAIN PIPE (this one is a 78 incher) frames a Buckeye trencher as it spews out coral bedrock on a 3-ft. wide drain line. "Big-inch" rig opens 200 feet of trench an hour in good going.

STRETCHING 104 feet between piers, this bridge on the R. H. Wright contract features prestressed beams that weigh 47 tons each. Maule Industries' local yard cast the king-size beams.

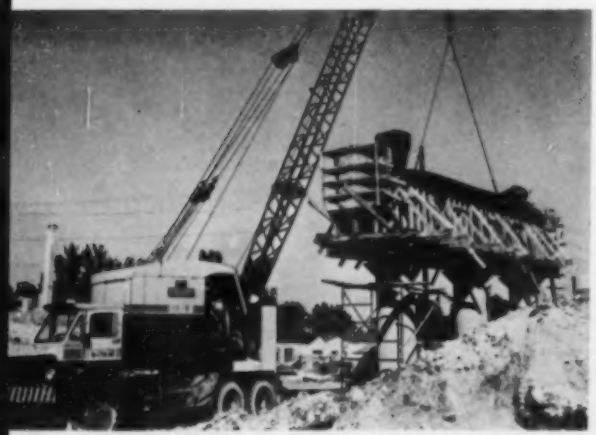
tendent on the job, notes that this method saves the time and the expense of bringing heavier equipment in just to get "the big ones."

While backhoes handle most of the trenching for drain lines, Reed Construction highballed its rock digging with a "big-inch" pipeliner. The Buckeye model 51 wheel trencher spearheaded a spread that also included a Lima backhoe that opened lateral ditches and a 22-B Transit crane that swung pipe sections into place.

The Buckeye rig opened a 3-ft. wide trench to full 6-ft. depth in one pass. The bucket wheel tore into the rock with steady pressure. In areas clear of debris (cables, pipes and bars cropped up in some of the leveled places) the trencher set a 100-foot-per-hour pace. This portion of the work was performed by W. T. Price Construction Co.



HIGH POUR (the forms for the pier tower 43 feet up) takes the long reach with a P&H truck crane. Each of the 4x4 piers requires 26 cubic yards of concrete.



REINFORCING CAGE for a pier cap rides into place on a Transit-Crane boom. Note the simple clamp-on collars that support the cap forms without any falsework underneath.

WHY BIG SWINGERS?

● To let you crowd trench sides ● To let you propel up steep grades ● To make possible uphill swinging when machine is working on a slope ● To increase production through greater efficiency. (60-65% of cycle time is in the swing)

Good clutches are just one of the reasons why Bucyrus-Erie excavators have always been worth more to the profit-minded customer.

BUCYRUS-ERIE COMPANY

18E61

BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin

NEWS FROM THE FIELD

PORTABLE HYDRAULIC dredge is rechanneling a drainage canal. Old canal appears at left. New canal will follow more direct channel and will be 95 feet wide, 10 feet deep and 22 miles long.

Dredge Keeps Open Irrigation Lifelines

Due to the lack of natural water resources in much of southern California, much of the agriculture in that area is dependent on extensive irrigation systems. It is most important to the area's economy that these systems be maintained in free-flowing operating condition.

One of the more important irrigation systems there is the Palo Verde irrigation district. Because of this system an area that was largely desert land has been completely transformed into productive farmland.

The project, consisting of a system of 310 miles of irrigation canals and 100 miles of drainage canals, irrigates some 120,000 acres (¾ of which are under cultivation). Drainage canals divert the water back into the Colorado river, creating a circular flow of water through the system.

A portable hydraulic dredge is a key link in expanding and maintaining this irrigation system. It widens and deepens canals, and removes silt from lagoons and basins. Material being removed is mostly sand and loam, which will be pumped into adjacent areas to create new farmland.

The dredge, an Ellicott "Dragon," is specially suited for this project, since it is versatile enough to handle both small and large dredging operations, and is portable.

Palo Verde officials plan to keep this unit in continuous operation for many years, expanding the irrigation project and keeping it in silt-free condition.

Solar Aircraft Developing Competitive Gas-Turbine Engine

A new 600-hp gas turbine, which is expected to surpass piston engines in competitive applications, is currently being developed by Solar Aircraft Co., San Diego, Cal., a subsidiary of International Harvester Co.

Solar has received a multi-million dollar contract from the U. S. Navy Bureau of Ships for a joint Army-Navy development of a turbine which has design objectives far beyond any gas turbines now in existence.

Among the target characteristics for the engine are:

1. A life cycle equal to or better than conventional reciprocating engines—with considerably less maintenance.
2. Fuel consumption of .4-lbs./hp-hr., equal to reciprocating engines and well below current industrial gas turbine performance.
3. A cost competitive with conventional reciprocating engines.

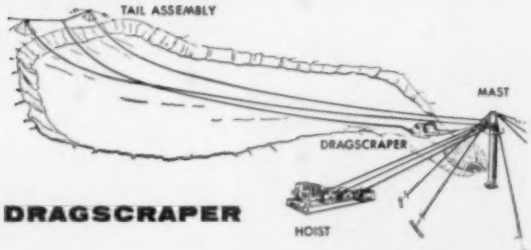
The engine development is predicted to be a giant step in extending both industrial and military use of the gas turbine engine. The 600-hp turbine contains principles and designs far beyond the current state-of-the-art, solar engineers say, and will make the gas turbine a real contender for a number of applications formerly re-

(Continued on page 43)

Cut Materials Handling Costs in Half . . . Dig *and Haul* with a Sauerman Machine

Operating costs as low as 6¢ per ton are reported by Sauerman DragScraper and Slackline Cableway owners. This cost includes labor, power and maintenance when digging free-caving material on average haul distances.

When you use a Sauerman DragScraper or Slackline Cableway, one machine does *both* digging and hauling from deposit to plant. No double handling is required. You cut labor and equipment costs in half—or even more—because a single Sauerman Machine, controlled by one man, replaces the multiple equipment needed for other methods.

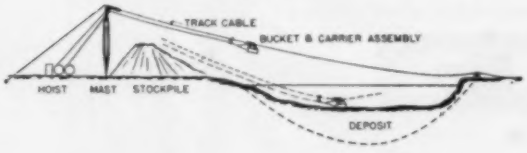


DRAGSCRAPER

DragScrapers are usually recommended for bank or pit deposits. They dig from hillsides or underwater as easily as on level ground and can haul directly to hopper or field conveyor. The Sauerman DragScraper hoist is designed for continuous duty and many years of service. The operator's control station may be remotely located for maximum visibility of deposit and plant.

DragScrapers are built in sizes from 1/3 to 15 yds. to satisfy practically all tonnage requirements.

SLACKLINE CABLEWAY



When deep digging is required or anticipated in the future, a Sauerman Slackline is usually best for the job. This powerful excavator can dig 100 ft. below water, lift its load and deliver the material to a stockpile on a 1000-ft. span.

The Slackliner Bucket inhauls at high speed and dumps automatically. Dumping point is determined by a stop button on the track cable. Gravity returns the bucket to the digging point, completing the fast operating cycle.

The use of a stockpile permits a single 2-yd. Slackline Cableway to handle the material requirements of a 200-tph. plant. Slacklines are built in sizes up to 3½ cu. yds.

★

Find out how you can save with a Sauerman Machine. Write or call, giving tonnage requirements and a description of your deposit. Sauerman engineers will supply their recommendations on the most economical machine for you.

SAUERMAN BROS., INC. 622 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS
Linden 4-4892 • Cable CABEX—Bellwood, Illinois

CRESCENT DRAGSCRAPERS • SLACKLINE AND TAUTLINE CABLEWAYS • DUROLITE BLOCKS

How two variables* make a constant winner

BUCYRUS-ERIE COMPANY

The 40-R drills 6¼ to 9-in. holes with electric or diesel-electric power. For bigger jobs, the all-electric 50-R drills 9⅞ to 12¼-in. holes.

The Bucyrus-Erie 40-R has been constantly setting new footage records. Here are two important reasons:

***VARIABLE DRILLING SPEED** — Ward Leonard variable voltage control lets you choose the correct rotary speed for a given formation and adapts instantly to changes without stopping the drilling operation.

***VARIABLE PULLDOWN PRESSURE** — Hydraulic down pressure works in any desired combination with rotary speed. Result: Record-breaking, bit-saving production under all conditions.

Let your Bucyrus-Erie sales representative tell you more about the tough, fast-working 40-R, or write Bucyrus-Erie Company, Drill Division, South Milwaukee, Wisconsin.

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News . . .

(Continued from page 40)

stricted to conventional reciprocating engines. Among the uses seen for the turbine are vehicle and marine propulsion, generator, pump and compressor drives and as an air conditioning power source.

Solar pioneered in the development of gas turbines before the end of World War II and currently manufactures a range of engines from 80-hp to 1,100-hp. According to Solar engineers, the new 600-hp engine is a completely axial flow regenerative machine with a six-stage compressor, dual rotary regenerators, a single-can combustor, a single-stage gas producer turbine and a single-stage power turbine. The engine will operate at a compressor pressure ratio of 3.8 and have a rotative speed of 21,500 rpm.

CIMA Announces Road Show Manager

The Construction Industry Manufacturers Association has announced the appointment of Martin C. Dwyer of Washington, D. C., as manager of the Construction Equipment Exposition and Road Show. This is the largest indoor industrial exhibit in the world, and is scheduled to open February 23, 1963 at the International Amphitheatre in Chicago.

M. C. Dwyer

The exposition is produced and managed by CIMA. It will have as co-sponsors the American Road Builders' Association; Associated General Contractors of America; Associated Equipment Distributors; and the International Road Federation.

Dwyer has participated in the staging of many national, regional and state trade expositions, including the recent Coal Show in Cleveland, Ohio. He has been manager of the Cleveland Convention and Trade Show Bureau, assistant director of the American Mining Congress expositions and exposition director of the National Retail Lumber Dealers Association exposition.

Dwyer is a native of Cleveland. He will establish permanent residence in Chicago.

Hook an OWEN Clamshell Bucket to your crane and you're *sure* of superior performance and longer life. For OWEN Buckets have exclusive super-efficiency and long-lived features you won't find in ordinary clamshells.

For instance:

- Block and tackle type reeving
- One-piece head construction
- Recessed lips
- Single main shaft
- Riveted bowl assembly

For over half a century OWEN has been building clamshell buckets—tailored to meet the requirements of "men who move the earth the world over".

So team your crane to the bucket with the BIG BITE that's JUST RIGHT for every job!

Write today for the money-saving facts and figures.

the OWEN

BUCKET COMPANY

BREAKWATER AVENUE • CLEVELAND 2, OHIO

BRANCH OFFICES: New York • Philadelphia • Chicago • Berkeley, California • Fort Lauderdale, Florida

EQUIPMENT YOU OUGHT TO KNOW ABOUT

1-Yd. Crane Excavator Has Cool Clutches

Newest addition to the Unit line of cranes and excavators is the model 271-C, a 1-yd. shovel which is convertible to dragline, trenchoe, clamshell, liftcrane and magnet crane front-ends.

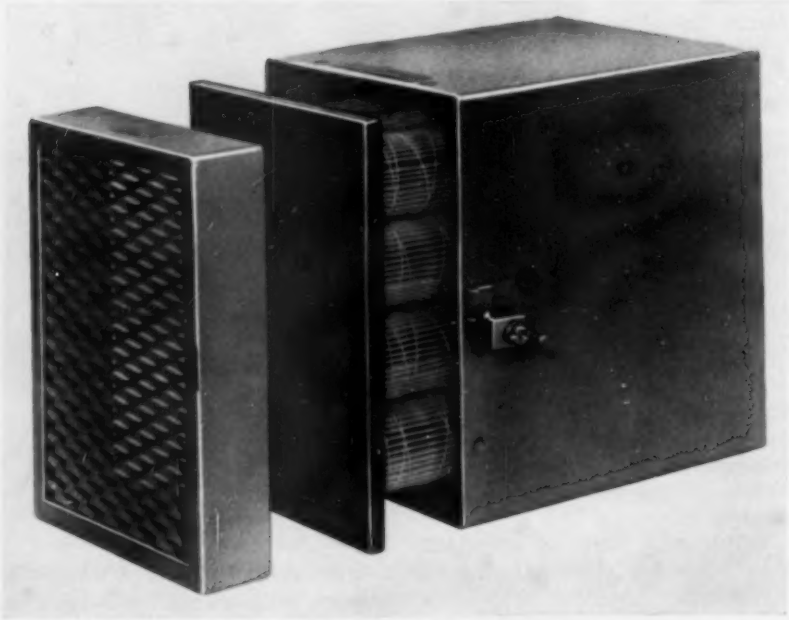
An important new feature is a compact swing circle gear assembly with upper works mounted on a large diameter, double live ring of steel balls running in hardened races.

The swing clutches on the model 271-C have a unique, cooling system which dissipates the heat, the manufacturer claims. Swingers run in a bath of oil which is kept cool by a set of copper coils connected directly to the radiator cooling system. Thermostatic control holds temperature below the point which clutch lining life is normally affected by heat.

Other features include: one-piece main machinery case; automatic traction brakes; straight-in-line engine mounting; disc-type clutches; and involute-splined shafts in upper works and crawlers.

Manufacturer: Unit Crane & Shovel Corp., Department EE, Milwaukee, Wis.

Long-Life Engine Air Cleaner



A new single-stage, dry type, engine air cleaner, known as the Farr Pamic air cleaner, is now available in 12 standard sizes for truck, tractor, and stationary engines ranging from 10 to over 1,000 horsepower.

The unit consists of a rectangular housing and a new modular type filter cartridge. The rectangular shape of the housing provides room for more filter paper, size for size, than the familiar "tub" configuration. The increase in filter paper (effective filtration area) results in greater dirt holding capacity and a lower pressure loss for the air intake system. The new design has achieved a 50% to 100% greater service life expectancy for the filter cartridge.

TRIAL SAMPLES

Of World-Famous WHITMORE'S Lubricants NOW IN AEROSOL SPRAY-ON CANS!

HANDI-LUBE LIQUID GEAR COMPOSITION

For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal —no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

WIRE ROPE SPRAY LUBRICANT

Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300% —special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

65 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

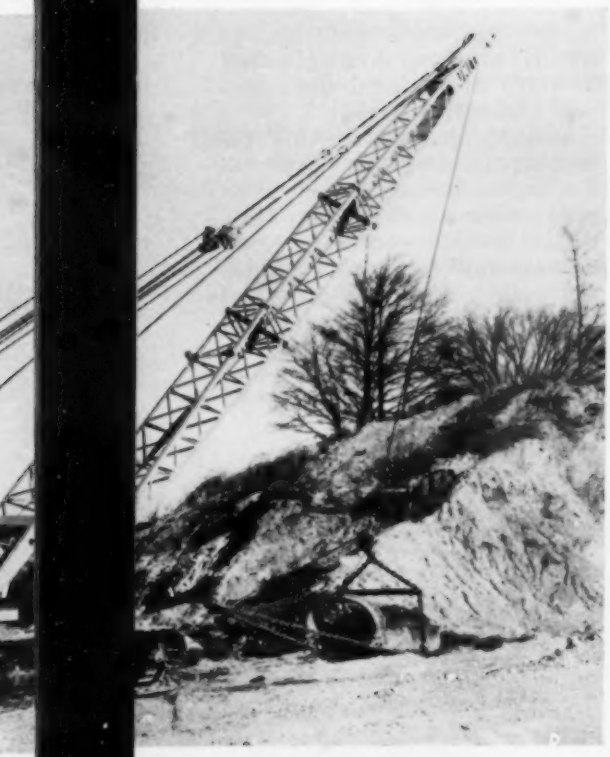
- Open Gears, Dipper Sticks, Cams
- Enclosed Gear Cases
- Wire Rope and Cable
- Hydraulic Units, Torque Converters
- Roller, Ball, and Sleeve Bearings
- Speed Reducers

Est. 1893

THE WHITMORE MANUFACTURING CO.

LUBRICATING ENGINEERS

CLEVELAND 4, OHIO, U.S.A. PHONE: VULCAN 3-7272



The face plate of the disposable Pamic cartridge is a rubber-like plastic (polyvinyl chloride) into which the filter paper is molded. The face plate forms an integral air seal when locked in place in the housing, eliminating the need for spare gaskets or seals.

The Pamic air cleaner is available in two models: Model "R" is equipped with an expanded metal grille, called a retainer frame, to lock the disposable cartridge in the housing; model "M" includes a moisture eliminator (instead of the retainer) to prevent airborne water droplets from entering the cartridge. Either model can be equipped with an optional rain guard for operation in exposed locations. A filter service indicator, which signals clearly when a cartridge change is required is also available.

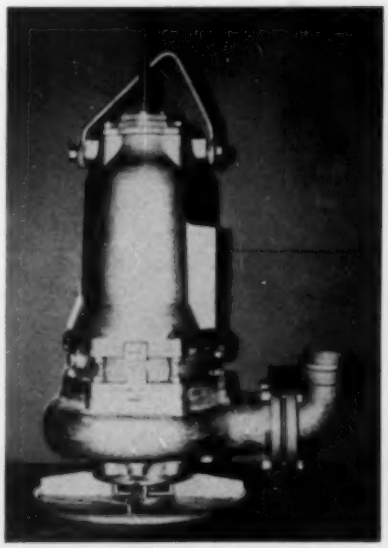
Manufacturer: Farr Co., Department EE, P. O. Box 90187, Airport Station, Los Angeles 45, Calif.

Submersible Trash Pump

A 220/440-volt, three-phase Flygt CS-100 electric submersible trash and sewage pump will handle silt, clay, weeds and water containing solids up to 2 inches without difficulty. Equipped with 6-hp motor and 4-in. diameter hose, the portable CS-100 is ideal wherever viscous liquids, process sludges, slurries, sewage or muddy water must be pumped.

It is lightweight, easy to move and has high capacity. Its small size makes it ideal for use in tanks, manholes, narrow wells and shafts where men are working.

This Flygt portable trash and sewage pump is used in emptying settling tanks, cesspools and process chambers, dredging muddy lakes and rivers and even dredging in sand. It is ideal for emergency service.



Manufacturer: Stanco Mfgs. & Sales, Inc., Department EE, 1666 Ninth St., Santa Monica, Calif.

FROM CONSTRUCTION WORK TO URANIUM MINING

"Bonded Buy used Cat equipment has always given me first-rate service," says GARN MOODY

Garn Moody has capitalized on his working knowledge of heavy equipment to branch out into a number of successful business operations. From his initial start in contracting, he has put his reliable spread of used Cat-built equipment to work in the non-allied fields of farming and, since late 1958, a thriving strip-mining operation in the rugged country near Delta, Utah.

"When you're moving into an unfamiliar new field, you've got to have smart crews and dependable equipment," says Garn Moody. "My used Cat-built rigs have always given me good steady production. We've worked our two D8s and two DW20s 8 to 10 hours a day since we bought them two years ago. The work is rough, but down time has been light."

Garn has purchased all three types of used equipment his Caterpillar Dealer offers: Bonded Buy, Certified Buy and Buy and Try. "In each case," he says, "the deal worked out fine for me. I'll buy under the same contracts any time. Dependability from Bonded Buy machines is like buying a new machine."

Success is never a sure thing, but if you're expanding your operations and trying to keep your equipment outlay on a budget basis—without sacrificing reliability—check your Caterpillar Dealer's protected purchase plans.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BEST BUYS IN NEW AND USED EQUIPMENT

New Equipment . . .

Concrete

New, improved concrete buckets, featuring extra large double clamshell gates and low loading heights, have been developed by Gar-Bro.

They are designed especially for handling the lower slump concrete that is now commonly encountered on many structural building jobs. These buckets have steep side slopes to accommodate stiffer concrete. Low loading heights make it possible to load up to and including the 2-yd. bucket from most ready-mix trucks.

The new buckets come in eight sizes ranging from ⅓ to 4 yards. These

Variable

A contractor in the middle of a bulldozing job may suddenly find that he needs an angle dozer instead of a straight blade. Or, maybe a forward "V" or tilted position of the blade would make the job go faster.

A new dozer blade, says Ulrich Mfg. Co., will speed up the job and add greater versatility to that old standby, the bulldozer. Called the Varidozer, the new blade is a completely different utility bulldozer with an almost unlimited range of hydraulically-controlled blade positions. The blade can be changed in seconds from

Bucket Line

buckets are normally equipped for manual gate operation, but air-operated gates and remote control for underwater placing are available. Fittings are built into the buckets for attaching rubber accordion hoppers or steel sub-hoppers.

According to the manufacturer, this new series replaces the Gar-Bro lightweight and standard duty concrete buckets and incorporates the best features of each.

Manufacturer: Gar-Bro Mfg. Co., Department EE, 2415 E. Washington Blvd., Los Angeles 21, Calif.

New Boom for Koehring 305 Hoe

A new 305 hoe boom—offering greater reach, digging depth, heeling range, and digging force—has been announced by Koehring. It is now standard on all 305 hoes.

Overall reach of the new boom has been increased to 33 feet; maximum digging depth to 20 feet; heeling range (distance bucket may be pulled from maximum extension before coming out of horizontal) increased up to 17%; and digging force up to 55%.

Reports on test machines in the field indicate 305's with new hoe boom are digging up to 40% more ditch per day.

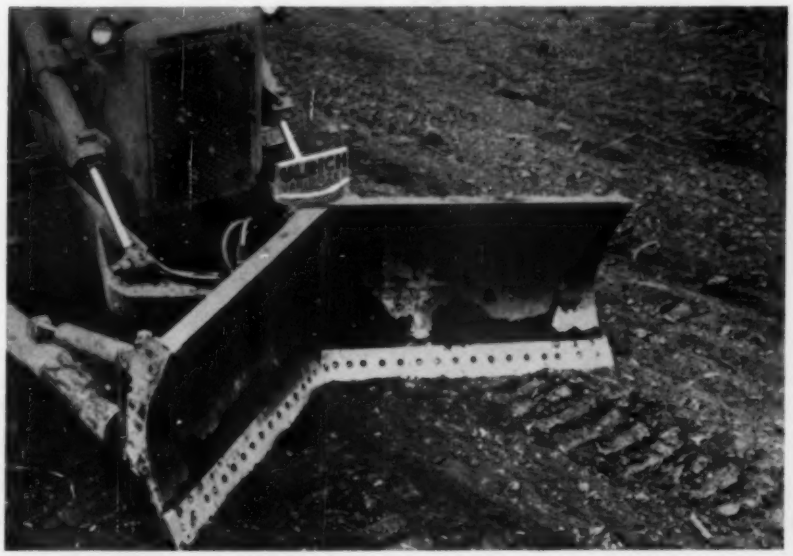
Manufacturer: Koehring Div., Koehring Co., Department EE, 3026 W. Concordia Ave., Milwaukee 16, Wis.

Dozer Blade

a straight blade to an angle blade, forward "V", reverse "V", tilt blade, or to any combination of these positions. The positions are controlled by four hydraulic levers mounted beside the tractor seat, giving instantaneous finger tip control of the blade.

Weighing about 6,000 pounds, the model 6H Varidozer was designed to be used on Caterpillar D6 tractors. It is the first of a new series. Other blades to fit larger tractors are planned for the future.

Manufacturer: Ulrich Mfg. Co., Department EE, Roanoke, Ill.



NOT IN THE CONTRACT

"I'm frightfully upset about my husband," a woman told the psychiatrist. "He blows smoke through his nose."

"Why, it's nothing out of the ordinary for a man to blow smoke through his nose!"

"But, doctor," the woman screamed, "my husband doesn't smoke!"

The results of the exam were exceedingly poor. Making inquiry, the professor asked, "Mr. Smith, why didn't you study for this examination?"

"I was holding hands with Lucy, sir."

"You are suspended for two days," snapped the angry prof.

"You, Mr. Baker, why weren't you prepared for the exam?"

"I was playing post office all last night."

"You are suspended for a week," roared the prof.

"Timothy—where are you going?"

"I'll see you next semester."

An ape came into the bar, ordered a scotch and soda and gave the bartender a $10 bill. The bartender assumed the ape wouldn't know the difference and handed back a fifty-cent piece in change. After a while he got curious about his customer. Leaning across the bar he remarked, "We, uh, don't see many apes in here these days."

"No," said the ape, "and at $9.50 a drink, I can understand why."

Five men were ordering breakfast in a restaurant. "I'll have pancakes," said the first.

"Hot cakes," called the second.

"Griddle cakes," said the third.

"Wheat cakes," said the fourth.

"They're all synonyms, aren't they?" asked the fifth.

"No," replied the waitress, "but if you want synonym, I can give you toast."

There was a Scotsman who wouldn't buy his girl a parasol when they went to the beach, but told her shady stories instead.

Wife (meeting husband at the door at 4 a.m.) "So, home is the best place after all."

Husband: "I don't know about that, but it's the only place open."

The Frenchman was talking to his English friend, regretting that his marriage had produced no children.

"My wife, she eez—how you say it?—impregnable," he said.

"Oh, I don't think you mean quite that, old man," replied his friend.

"Well, then, she eez—inconceivable?"

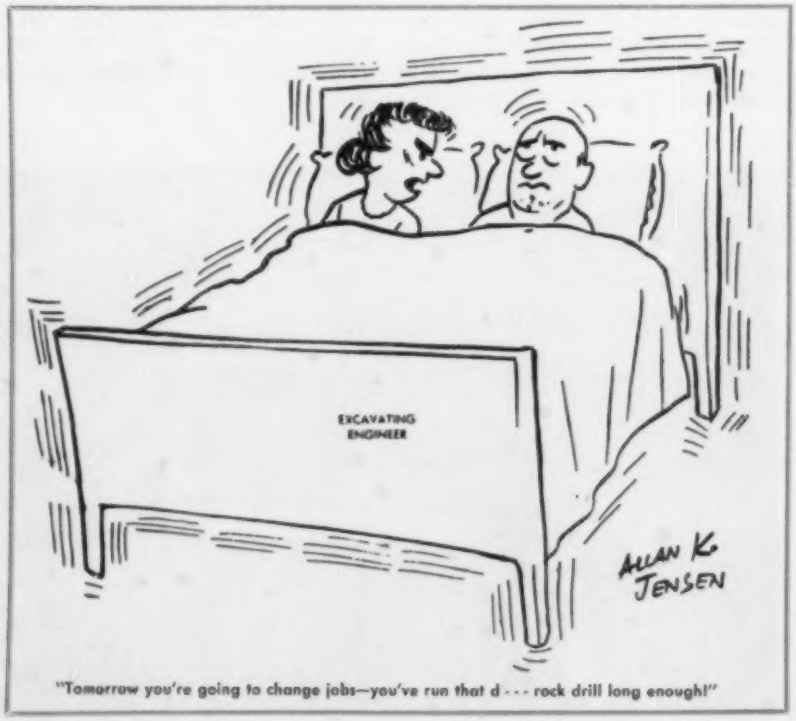
"No, that is not correct," came the rejoinder.

"Ah, attendez. She mus' be—unbearable!"

An Alaskan on arriving in Texas approached a bystander and asked, "Where may I find a doctor?"

"Are you ill?" inquired the Texan.

"No," grinned the Alaskan, "I'm suffering from claustrophobia."



"Tomorrow you're going to change jobs—you've run that d - - - rock drill long enough!"

During mock maneuvers an army officer ordered a notice to be displayed on a bridge stating: "This bridge has been destroyed by air attack." But to his chagrin, he noticed through his field glasses that a foot regiment was crossing the bridge despite his orders. He sent his adjutant to the officer in charge to find out how he dared to defy his orders. An hour later the adjutant was back. "It's all right, sir," he reported. "The troops are wearing signs saying, 'We are swimming'."

The judge listened intently to a case against a man who was charged by his wife with non-support. After all the evidence was in, the judge told the defendant, "You haven't taken proper care of this good woman and I'm going to give her $25 a month."

The defendant beamed with pleasure. "That's mighty nice of you, your honor," he said. "And I'll give her a dollar or two from time to time myself."

MILWAUKEE JOURNAL PHOTOS

"For a smooth pick-me-up, you can't beat a HYDROCRANE"

The unusual operation described here may seem far removed from your job. Yet, is it really? Look.

Don't you handle costly loads? . . . like transformers, prestressed concrete sections, or porcelain insulators?

Samson and Sambo were labeled "priceless" by the director of the Milwaukee County Zoo. That's why the HYDROCRANE®, with its unmatched gentleness and quietness was chosen for this delicate moving job.

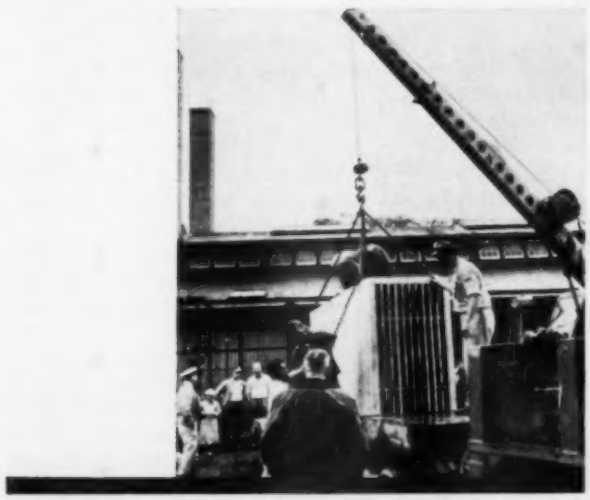
Isn't travel speed important in order to cut down unprofitable between-job travel?

In this case the HYDROCRANE moved fast enough to stay with the job. It was on hand to place the cage gently on the truck. And it was there in time to unload it at its destination.

Don't you often have a touchy positioning problem?

HYDROCRANE's telescoping boom was able to ease the cage gently out under low overhead structures and to nose it into place at the new zoo.

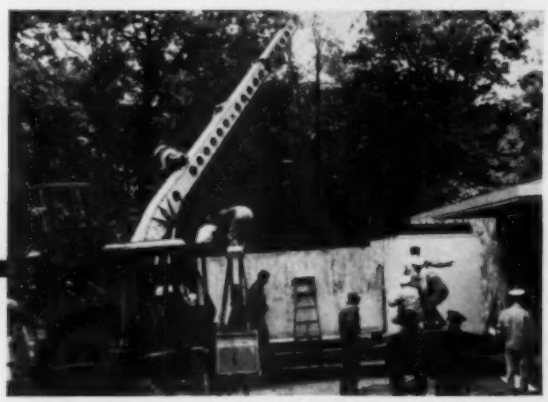
6H61



Goodbye to the old home—the HYDROCRANE crane-excavator eases Samson's and Sambo's portable cage out of the gorilla house at the old Milwaukee Zoo. Gentle handling and low sound level were two reasons for choosing this machine.

BUCYRUS-ERIE COMPANY

Let your Bucyrus-Erie distributor tell you more about the HYDROCRANE features that will make your job faster, easier, and safer.
Bucyrus-Erie Company, South Milwaukee, Wisconsin.

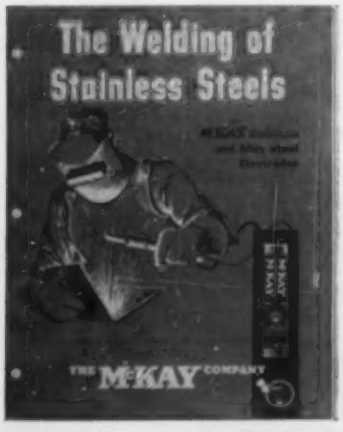


Welcome to the new home — there was no delay for Samson and Sambo at their destination. Fast travel speed enabled the HYDROCRANE to move quickly through city traffic . . . to be on hand for the delicate unloading operation when the gorilla cage arrived.

LITERATURE FOR EARTHMOVERS

Subject: **Gooseneck Trailers**
Content: A six-page illustrated folder describes Martin folding gooseneck and lightweight trailers. It outlines the safe, fast loading advantages of the trailers. Color illustrations explain the operating ease of the folding gooseneck. Extra payload-carrying advantages of lightweight trailers are detailed. Available models of both series are listed with carrying capacities.
Where to get: Martin Trailer dealers or Hyster Co., Martin Trailer Div., Department EE, Kewanee, Ill.

Subject: **Stainless Steel Welding**
Content: A manual, *The Welding of Stainless Steels,* designed to function as a general reference guide on the entire subject of stainless steel welding, has been published by the McKay Co. Detailed explanations are given on the various stainless steels in common use today. The practical procedures for their welding and types of electrodes and wires available for their use are covered in most part, in easy-to-follow question and answer form. Questions are aimed directly at fundamental welding problems and the answers point out the reasons for these problems and



methods for arriving at solutions. In addition, the manual contains information on the specific effects of alloying elements in stainless steels and high strength heat resisting alloys. Also listed in a handy reference chart format, are the ASTM stainless steels with recommended electrodes in the welding of these steels.
Where to get: McKay Co., Department EE, 1005 Liberty Ave., Pittsburgh 22, Pa.

Subject: **18-Yd. Tractor-Scraper**
Content: *Climb Aboard the New 619C* is the title of a six-page brochure about one of the newer machines in the Caterpillar wheel-scraper line. Loading characteristics are detailed from the time the load is picked up until it is dumped on the fill. The brochure also points out the smooth ride obtained through the exclusive torsionflex seat. Features described include the torque divider drive; the 18-yd. bowl; the six speeds requiring only three shifts; large diameter tires; and perfect machine balance. Ask for booklet D116.
Where to get: Caterpillar dealers or Caterpillar Tractor Co., Department EE, Peoria, Ill.

Subject: **Clams, Grabs, Grapples**
Content: A new 50-page book contains valuable information on clamshell buckets, grabs and grapples including data on how to choose the proper bucket and tables showing the relationship of buckets to weights of materials and sizes of cranes. Ask for bulletin 2L-60.
Where to get: Erie Strayer Co., Department EE, Rudolph Ave., Erie, Pa.

Subject: **Athey Trailers**
Content: *Payload! Power! Performance!* is the title of a 16-page brochure about Athey's new T-Line trailers. The six trailers are designed and built for specific hauling jobs in the earthmoving, mining, quarry or coal hauling fields. Details are given about extra capacity, tough "T-1" steel construction, and the use of new Caterpillar diesel power for faster haul speeds and increased usable power. Full specification data is also given for each trailer showing capacity, power, haul speed and special construction features.
Where to get: Athey Products Corp., Department EE, 5631 W. 65th St., Chicago 38, Ill.

Subject: **1½-Yd. Crane-Excavator**

Content: A new, two-color bulletin features the Koehring 605 crane-excavator rated as a 1½-yd. shovel and 36-ton crane. Self-cleaning crawlers, adjustable tapered hook rollers, one-piece fabricated turntable, spring set, air release traction brakes, power clutch, tapered hoist lagging and other features are described and illustrated.
Where to get: Koehring Div., Koehring Co., Department EE, 3026 W. Concordia Ave., Milwaukee 16, Wis.

Subject: **Dozer End-Bits**
Content: An eight-page booklet gives all relevant part numbers and complete catalog information on end bits for various tractor models and dozer types. Furnished in Amsco "CS" multiple alloy steel, these end bits maintain sharp cutting edge and provide up to three times service life of ordinary carbon steel bits.
Where to get: American Manganese Steel Div., American Brake Shoe Co., Department EE, 389 E. 14th St., Chicago Heights, Ill.

NOTES from the Manufacturers

Bucyrus-Erie Co., South Milwaukee, Wis., has opened a new midwestern sales office in St. Louis at 7551 Carondelet Ave., in suburban Clayton, Mo. George D. Grayer will be sales manager of the

G. D. Grayer

S. A. Stone

new district. Grayer formerly was drilling equipment sales manager in South Milwaukee. The newly formed sales region covers Kentucky, southern Indiana, southern Illinois, Missouri, Iowa, Kansas and Nebraska. Grayer will be succeeded by Selden A. Stone, who will be responsible for marketing the Bucyrus-Erie line of blast hole drills, water well drills and oil spudders. Stone formerly was assistant drill sales manager, and previously served five years as sales manager of oil and water well drills.

Gill Drilling Equipment Co., Inc., North Branford, Conn., has added Robert E. Price to its sales staff. For the past five years, Price served the blast hole drilling field in the northeastern United States as industrial representative in the rock bit sales department of a leading rotary bit manufacturer.

R. E. Price

SHOCK

CAN'T BREAK ERIE CORNER BARS

Unconditionally Guaranteed

Erie Corner Bars, like Erie Teeth, (solid and two-part alike), are guaranteed against breakage for the life of the bucket. All broken corner bars are replaced "No Charge", f.o.b. Erie

As far as we know, no other manufacturer offers such protection. Yet Erie Clamshell Buckets cost no more to buy. Why not enjoy this added protection at no extra cost?

6 MORE ERIE FEATURES THAT SAVE YOU MONEY

- Fewer Moving Parts
- More Beef Built *into* Moving Parts
- More *Quality* Too
- Lower Headroom
- Recessed Alemite Fittings
- Hardened Steel Sheave Bushings

WE CAN *PROVE* OUR ADVERTISING CLAIMS!

ERIE BUCKETS THE WORLD OVER

Write for Catalogs

ERIE STRAYER COMPANY

981 RUDOLPH AVENUE • ERIE, PENNSYLVANIA

TO ADVERTISE: All advertising in this section is payable in advance. Rate $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters. Count spaces and punctuation as one character each. Be sure to enclose the correct amount of money with your order. Rates and conditions subject to change without notice. Closing date—10th of preceding month. Example: January closes December 10th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the listed address. If box number is used, mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Marion model 5561 stripping shovel, 120-ft. boom, 57-ft. 9-in. effective handle, 48-ft. 10-in. over-all length of crowd handle, 40 and 47-cu. yd. dippers. Location Middle West. Write:

EXCAVATING ENGINEER
Box 3767 South Milwaukee, Wis.

Bucyrus-Erie 200-W diesel dragline with 125-ft. boom and Cooper-Bessemer diesel engine. Two 6½-yd. and one 6-yd. Page buckets included. Spare parts available at reasonable price. Excellent condition. Located in Middle West.

EXCAVATING ENGINEER
Box 3771 South Milwaukee, Wis.

Bucyrus-Erie model 120-B electric shovel, 29' 6" boom, 22' handle, 4¾-yd. dipper, 36" treads, for 3/60/2300 volt service. Large quantity spare parts included. Location New York state.

EXCAVATING ENGINEER
Box 3773 South Milwaukee, Wis.

1—Bucyrus-Erie 200-W Monighan dragline with Cooper-Bessemer diesel engine. Location—Ohio.
2—Lorain 820 draglines—one with Cat D13000 and one with Waukesha 6 WAKD engine. Location—Sydney, Nova Scotia, and Hamilton, Ontario.
1—Manitowoc 4500 dragline with Cummins NVH18 engine. Location—Sydney, Nova Scotia. Write or phone:

HECKETT ENGINEERING CO.
Butler, Pa., U.S.A.

Lima model 2400 dragline, 120-ft. boom, 7-cu. yd. dragline bucket, Cooper Bessemer STR-8 diesel engine. Air start auxiliary engine, light plant. Location western Pennsylvania. Write:

EXCAVATING ENGINEER
Box 3766 South Milwaukee, Wis.

EUCLIDS
Rear, Bottom and Scrapers

12-yd. Bucyrus-Erie dragline.
9-yd. Bucyrus-Erie dragline.
8-yd. Bucyrus-Erie shovel.
6½-yd. Bucyrus-Erie shovel.
4-yd. Bucyrus-Erie shovel.
4-yd. Bucyrus-Erie dragline.
3-yd. Bucyrus-Erie shovel.
2½-yd. Bucyrus-Erie shovel and dragline.
1¼-yd. Bucyrus-Erie shovel.
5-yd. Manitowoc shovels and dragg.
6-yd. Lima dragline and shovels.
Large stripping shovels.
Other equipment available, not listed above.

WILLIAM LUBRECHT, III
Construction Equipment
811 W. Diamond Ave. Hazleton, Pa.
Phone: GLadstone 5-4041 or 5-0523

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

IMMEDIATELY AVAILABLE

B-E model 120-B elec. shovel #46011 Westinghouse apparatus.
B-E model 120-B elec. shovel #58182 Westinghouse apparatus. (Machine #58182 includes dragline attachment)
B-E model 120-B elec. shovel #52553 G.E. apparatus.
B-E model 120-B elec. shovel #52555 G.E. apparatus.
B-E model 5-W dragline #609 diesel powered.
B-E model 5-W dragline #716 diesel powered.
Located in northeastern U.S.A., available for immediate inspection and delivery.
B-E model 200-W diesel dragline #735. Machine is presently located in Montana.

EXCAVATING ENGINEER
BOX 3760 SOUTH MILWAUKEE, WIS.

HEAVY EXCAVATION EQUIPMENT
DRAGLINES, SHOVELS, CRANES, DRILLS, TRUCKS

9-W B.E. Elec. Drag, 200', 8 yd. or 160', 10 yd.
9-W B.E. Diesel Drag, 165', 12 yd.
7-W B.E. Diesel Drag, 140', 7 yd.
7400 Marion Diesel Drag, 175', 13 yd.
7400 Marion Elec. Drag, 175', 12 yd.
625 Page Diesel Drag, 160', 9 yd.
631 Page Elec. Drag, 200', 8 yd.
621-S Page Diesel Drag, 125', 7 yd.
183-M Marion Diesel Drag, 130', 8 yd.
200-W B.E. Diesel Drag, 125', 6 yd.
2400 Lima Elec. Drag, 130', 6 yd.
2400 Lima Diesel Drag, 130', 6 yd.
7200 Marion diesel drag, 135' 5 yd.
4500 Manitowoc Drag, 120', 5 yd. & 140', 4 yd.
120-B B.E. Elec. Drag, 115', 5 yd.
71-B B.E. Crane with 160' boom.
3900, 3500 & 3000 Manitowoc Cranes.
111-M Marion Drag, 100', 4 yd.
1055 P&H Diesel Drag, 80', 4 yd.
1601 Lima 4 yd. Shovel/Drag.
1201 Lima Drag, 85', 3 yd.
54-B B.E. Drag, 80', 2½ yd.
5560 Marion 26 yd. Elec. Shovel.
5323 Marion 18 yd. Elec. Shovel.
190-B B.E. 8 yd. Elec. Shovel.
151-M Marion 7 yd. Elec. Shovel.
1600 P&H 6 yd. Elec. Shovels.
170-B B.E. 6 yd. Elec. Shovel.
4161 Marion 6 yd. Elec. Shovel.
2400 Lima 6 yd. Std. & H.L. Shovels.
120-B B.E. & 4121 Marion 4 yd. Elec. Shovels.
1055 P&H 3 yd. H.L. Shovel.
111-M Marion Std. & H.L. Shovels.
1201 Lima & 54-B B.E. Standard Shovels.
#6 Northwest 1½ yd. Standard Shovel.
Model T-650 REICHdrill Truck Mtd. Rotary & Down-The-Hole.
Ingersoll-Rand Truck & Crawler Mtd. Drillmasters.
Euclid Trucks, Rr. & Bottom Dump; Dozers, etc.

FRANK SWABB EQUIPMENT CO., INC.
312 Hazleton National Bank Bldg.
Hazleton, Pa. — GLadstone 5-3638

Bucyrus-Erie model 750-B electric shovel with 95-ft. boom, 64-ft. handle and 12 cubic yard dipper. Some spare parts included. Location east central states. Write:

EXCAVATING ENGINEER
Box 3763 South Milwaukee, Wis.

P&H model 955 diesel dragline and cranes, Waukesha 6WAKD engine, 70' boom, long wide crawlers, location in Middle West.

EXCAVATING ENGINEER
Box 3772 South Milwaukee, Wis.

Bucyrus-Erie electric 120-B. Combination shovel-dragline. Located Anthracite region. Excellent condition. Priced to sell. For further information write:

EXCAVATING ENGINEER
Box 3764 South Milwaukee, Wis.

Bucyrus-Erie 170-B electric shovel. Located Anthracite region. Available immediately. Excellent condition. For further information write:

EXCAVATING ENGINEER
Box 3765 South Milwaukee, Wis.

9-W electric dragline—located eastern United States. Excellent condition. Priced for quick sale. Write:

EXCAVATING ENGINEER
Box 3769 South Milwaukee, Wis.

Marion 482 #6353.
Marion 4161 #8197.
Bucyrus-Erie 54-B diesel #103533.
All equipment subject to prior sale.

Contact:
PICKANDS MATHER & CO.
Purchasing Department
700 Sellwood Building
Duluth 2, Minn.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 22-B shovel, Serial #81232, with Caterpillar D318 engine E3/4J3.
Bucyrus-Erie 19-B shovel, Serial #13016 with 22-B undercarriage, Waukesha Gas Engine J180. Serial #61320D.
Bucyrus-Erie 22-BTC #86258, with 60′ boom and fairlead.
Lorain model TL20 serial #18174 backhoe with Waukesha Gas Engine 6EZ144E.
Model TU-3 Snogo snow plow, Serial No. 768, with Climax R-61 engine, Serial No. 15825, mounted on FWD truck.
Koehring model 205 shovel and hoe, ½-yd., Serial No. 5262C, powered with International gas engine #17366. 1948 model.
Model L-41 Lorain hoe with Waukesha gas engine. Serial No. 17832.
Unit model 1020 ¾-cu. yd. shovel, Serial No. 51256, powered with Chrysler gas engine.
K12 Insley ½-yd. backhoe, Serial #3671, powered with Buda engine.

CLYDE EQUIPMENT CO.
3410 First Ave., S.
Seattle 4, Wash.

CRAWLER TRACTORS

HD21 Serial No. 8695 with cable dozer and rear double drum power control unit. Rebuilt and rented.
Allis-Chalmers HD21 Serial No. 7876 with cable dozer and rear double drum power control unit. Completely rebuilt and rented.
HD21 Serial No. 7116 with rear power control unit and push block. Rebuilt and rented.
Allis-Chalmers HD11B with hydraulic dozer. Completely rebuilt and in excellent condition.
Allis-Chalmers HD9G tractor loader with 2-yd. bucket. Completely rebuilt and in good condition.
Allis-Chalmers HD6G tractor loader with 1½-yd. bucket. In very good condition.
Allis-Chalmers HD5G tractor loader with 1-yd. bucket. Rebuilt and in very good condition.

SCRAPERS

Two Allis-Chalmers TS260 motor scrapers. Serial Nos. 2557 and 2558. Both have been rented a short time since rebuilding. Very Good condition.
Allis-Chalmers TS260 motor scraper. Serial No. 4161. This is a late model 260 with very little use.

CRANES AND SHOVELS

Marion 93M, 2½-yd. shovel with a Cummins Diesel engine. This machine is in excellent condition.
Bucyrus-Erie H3 Power Take-off Hydrocrane mounted on a 6x6 carrier with a ½-yd. clamshell bucket. In very good condition.
Bucyrus-Erie 15B with ½-yd. backhoe. This machine has been rebuilt and is in excellent condition.
Northwest No. 6, Serial No. 18383 backhoe with a Murphy diesel. Backhoe boom is 27′4″, handle 10′2″. Three 1½-yd. backhoe dippers and one is a brand new Esco. 60′ crane boom, continuous suspension and two point sheaves. Basic boom is 45′ with one 10′ and one 5′ insert with fairlead. Track is 11′4″ overall width, 14′8″ length and 33″ treads.
Bucyrus-Erie 22-B ¾-yd. backhoe. Has a Caterpillar diesel engine. Rebuilt and in very good condition.
Bucyrus-Erie 22-B clamshell with 40-ft. boom. Has a GMC diesel engine. Rebuilt and in very good condition.

MISCELLANEOUS

Barber-Greene black top paver. Gas engine. Make an offer.
Cleveland 140 wheel-type trencher. 16-in. buckets, 21½-in. cut. Completely rebuilt.
Gallon 8-12 ton tandem roller. Excellent condition.
Michigan 125A rubber tired loader in perfect condition with practically new tires and 1½-yd. bucket.
Michigan 175A rubber tired loader with a 2¾-yd. bucket. Has a Waukesha diesel engine and is in excellent condition.
Caterpillar D8-2U series with angle dozer and power control Unit. In very good condition.
Barber-Greene Model 44 ladder type ditcher with new buckets and teeth. This machine has a gas engine and is in very good condition.
Ingersoll-Rand 315 Gyro-Compressor with gas engine. Has good tires and in good condition.

D. D. KENNEDY, INC.
P. O. Box 177 **Bellwood, Ill.**
AUstin 7-4300 **LInden 4-5000**

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie model 15-B, serial No. 33505 with AC model HB351 gasoline engine, ½-cu. yd. hoe, 16″ treads, standard crawlers. Currently being rebuilt in our shop.
Bucyrus-Erie model 38-B shovel. Serial No. 73291 with Caterpillar D13000 diesel engine with gasoline starting engine with electric starter. 13′7″ crawlers with 33″ treads. Machine currently being rebuilt in our shop.
Bucyrus-Erie model 51-B 2½-yd. shovel, serial No. 62581, with Caterpillar D17000 diesel engine, standard crawlers with 36″ treads. Low hours. Reconditioned and in very good condition throughout.
Unit model 617 ⅝-yd. hoe, serial No. 54125 with General Motors diesel engine with torque converter. New tracks, tumblers, etc. Excellent condition throughout.
Link-Belt LS-51 cambered boom backhoe, 1952 machine. As inspected $4,250
Koehring model 304, serial No. 8624 ⅜ cubic yard backhoe with International UD14 diesel engine. Good working condition. "As is" $4,500
Bay City model 65, Serial No. 4058, combination 1¼-yd. shovel and 1¼-yd. hoe with Cummins diesel engine. $7,000 spent in repairs within past year. Good working condition throughout. As inspected ...$10,500
P&H truck crane, model 155ATC, serial No. 18206, 30′ boom with clamshell equipment less bucket. Good condition throughout.
Lorain model L50K, serial No. 25389, Cat D318 diesel engine, extended crawlers with 30″ treads, independent power boom hoist, 1-cu. yd. shovel front with AMSCO dipper. Other attachments available. Good condition throughout.
Bucyrus-Erie Hydrohoe Attachment for H-3 Hydrocrane with 18″ general purpose dipper, 20″ utility dipper, 12″ narrow dipper and all necessary fittings. Excellent condition $750
Bucyrus-Erie model 15-B shovel front complete with dipper trip, chains and lagging $1,200
Bucyrus-Erie model 22-B shovel front complete with dipper trip, chains and lagging. Good condition $1,500
Lorain ¾-yd. shovel front, Amsco bucket complete with dipper trip. Excellent condition throughout $1,500
Bay City model 45 ¾-yd. shovel front complete with dipper trip. Good condition. $1,500

BINDER MACHINERY CO.
Brighton St., Union, N. J.
MUrdock 8-0060

SHOVELS

1—Bucyrus-Erie Hydrohoe—mounted on 2-ton Chevrolet—24″ dipper. Late model—very good condition. $8,750
1—Bucyrus-Erie model 20-B, ¾-yd. Cat engine, logging heel boom, good undercarriage $8,500
1—P&H model 255A, ¾-yd. P&H diesel engine, extra long tracks, no fronts included, new in 1954 .....$7,500
1—Northwest model 25, ¾-yd. Cat engine, shovel and dragline attachment (an older machine, but ready for work.) $5,500
1—Link-Belt model K-360, 1½-yd. Cat engine, shovel and dragline attachments, ready for any job $17,500
1—Bucyrus-Erie 71-B shovel, GMC 6-110 engine, 3-cu. yd. Amsco bucket s/n 116168. Located at Williams, Ariz. $70,000
1—Bucyrus-Erie 54-B shovel/crane, Buda 6DC 1879 engine, s/n 60319. Located at Portland, Ore. $28,000
1—Bucyrus-Erie 54-B dragline, Buda 6DC 1879, s/n 24654. Located at Leesburg, Ala. $22,500

SCRAPERS

1—Euclid model 8TDT, 3 axle, 15½-yd. struck, Cummins engine, good condition. $15,500
1—Euclid model 14TDT, 3 axle, 15½-yd. struck, Cummins engine, good condition. $15,500
3—Caterpillar model DW-20 turbo-charged engines, 3 axles, 2 extra 18-yd. bottom-dumps and 1—5,300 gal. water wagon. Late models and in good condition. Price includes extra trailers and water wagon. $75,000
1—LeTourneau model B, 2 axle, Cummins engine, 27:00x33 tires, 18-yd. struck, late model, good condition $17,500

INTERMOUNTAIN EQUIPMENT CO.
P. O. Box 1129 **Boise, Idaho**
Phone: 3-6441

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

DRAGLINES

30-B Bucyrus-Erie crawler mounted dragline, Cat D318 13′ long cats, 30″ treads, 60′ boom, fairlead, 1959 rental and demonstration machine, low hours, discounted for demonstration use.
22-B Bucyrus-Erie crawler mounted dragline, ¾-yd., G.M.C. 3-71 diesel engine, 12′ long crawlers, 26″ treads, 50′ boom, fairlead. Will sell as is or repair to suit.
22-B Bucyrus-Erie crawler dragline, Buda K-428 gas engine, 12′ long crawlers, 26″ treads, 50′ boom, fairlead, 1955 machine, excellent condition.
45—Bay City crawler dragline, ¾-yd. capacity, 45′ boom, dragline fairlead, long crawlers, good condition, priced to sell.
11-B Bucyrus-Erie truck mounted dragline, 40′ boom, Continental gas engine, fairlead, 6-wheel drive truck carrier, excellent condition. Discounted for rental and demonstration use.

SHOVELS

30-B Bucyrus-Erie crawler shovel, Cat D318 diesel engine, 13′ long crawlers, will handle up to 1¾-yd. dipper. In like new condition, discounted for rental use.
29-B Bucyrus-Erie crawler shovel, older heavy-duty 1-yd. machine, Cat diesel engine. A real rugged machine in good condition. $2,000 in extra parts with machine. A real bargain.
22-B Bucyrus-Erie shovel, ¾-yd. capacity, G.M.C. 3-71 diesel engine, 26″ crawler treads, ⅝-yd. dipper. A good reliable shovel at the right price.
34—Lima shovel, ¾-yd. capacity, Cat D318 diesel engine, machinery overhauled and in excellent condition. Repainted and offered at a real saving.
375—American, ¾-yd. capacity, Waukesha gas engine, needs some work but would make a standby or extra machine at a low, low price.
11-B Bucyrus-Erie truck-mounted shovel, mounted on 6-wheel drive truck chassis, Continental gas engine, machine in excellent condition. Other attachments available to convert to hoe or crane.

LIFTING CRANES—TRUCK MOUNTED

357 Unit wagon crane, 7-ton capacity, Chrysler gas engine, machinery overhauled and machine repainted. Excellent condition and priced to sell.
14-B Bucyrus-Erie truck crane, 15-ton capacity, 6-wheel drive carrier, 60′ of HYDRAULIC TELESCOPING BOOM. Outriggers with screw jacks and aluminum floats, a like new machine with a demonstrator discount.
"L" Quickway truck crane, 10-ton capacity, 60′ of boom and 20′ jib, heavy duty carrier, gas power, front and rear outriggers. Good condition and priced to sell.
11-B Bucyrus-Erie truck crane, 10-ton capacity, 6-wheel drive carrier, up to 70′ of boom and jib, gas power, power controlled lowering of boom. Excellent condition with demonstrator discount.

BACKHOES

30-B Bucyrus-Erie, crawler mounted hoe, 1 to 1¾-yd. dippers available, Cat D318 diesel engine, 13′ long crawlers, 30″ treads. Demonstrator machine in excellent condition offered at a good reduction.
34 Lima crawler mounted hoe, ¾-yd., Cat D318 diesel engine, cambered hoe boom, ¾-yd. dipper, machinery overhauled, repainted and in excellent condition. Price reduced for quick sale.
11-B Bucyrus-Erie truck-mounted hoe, 17″ to 36″ wide dippers available, Continental gas engine, 6-wheel drive carrier, machine in excellent condition. Discounted.

HYDROCRANES

H-2 Hydrocranes, 2-ton capacity, 3 available at prices from $1,750 and up.
H-3 Bucyrus-Erie Hydrocrane, 5-ton capacity, 2-piece telescopic boom, hydraulic outriggers, 6-wheel drive carrier, bucket and reel. Machine overhauled and in excellent condition.

See us for rental cranes and shovels. Bucyrus-Erie dragline buckets. Used booms and Buckets.

J. P. WAITE, INC.
3304 W. Pierce St. **EV 4-1900**
Milwaukee 15, Wis.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

EXCAVATORS

Bucyrus-Erie 10-B truck-mounted hoe, #16114, FOB, Columbus $6,000

Bay City ¾-yd. model 10 crane, #215-56, FOB, Cincinnati $3,750

Unit 617 trenchoe—½-yd., #54250, FOB, Columbus $12,500

Unit 1020 base machine only, #48730, FOB, Columbus $1,500

Badger Hopto 105D trenchoe, #350, FOB, Columbus $750

Unit 614 trenchoe, #54315, FOB, Cincinnati. $11,500

Lorain TL-40 ½-yd. hoe-crane, #2679, FOB, Cincinnati $4,500

Lorain TL-20 ½-yd. clamshell, #15927, FOB, Cleveland $6,500

Lima 34 truck crane, 55' boom, #32863, FOB, Cincinnati $17,000

REAR DUMPS

Euclid R-15 (5FD) quarry body, #1622, FOB, Columbus $10,500

Euclid R-22 (46TD) standard body, #20151, FOB, Columbus $22,500

Euclid R-18 (91FD) standard body, #29875, FOB Columbus $23,850

BOTTOM DUMPS

Euclid 9FDT-58W, #1495, FOB, Cleveland. $8,250

Euclid 9FDT-58W, #1112 FOB Cleveland. $7,850

Cat DW-10, #IN 2763, FOB, Cincinnati. $2,500

Cat DW-10, #IV2807, FOB, Cincinnati. $4,000

LOADERS

Hough HA Payloader, #26740, FOB, Columbus $2,000

Barber Greene bucket loader, #274747, FOB, Columbus $980

Haiss 75-C bucket loader, #K-5751, FOB, Columbus $950

Nelson P-11 bucket loader, #531281 FOB, Cleveland $5,000

CRAWLER TRACTORS

Euclid C-6, #30064, FOB, Cincinnati. $33,850

Cat D8, #13A2413, FOB, Cadiz $12,500

Cat D4/W loader, #35C53, FOB, Cincinnati. $5,000

Cat D4, #32052, FOB, Cleveland $7,500

Allis-Chalmers HD-5 W/loader, #21446, FOB, Columbus $6,750

Allis-Chalmers HD-21, #8067, FOB, Columbus $15,000

WHEEL TRACTORS

IHC Farmall H W/trencher, #365591, FOB, Maumee $1,485

SCRAPERS

Euclid S-7, #25258, FOB, Columbus .. $21,500

Euclid S-7, #25241, FOB, Columbus .. $19,750

Euclid S-7, #24484, FOB, Cincinnati. $16,750

Euclid S-7, #24724, FOB, Cincinnati. $22,500

Euclid S-7, #25242, FOB, Cincinnati. $20,000

Euclid S-7, #24628, FOB, Cincinnati. $16,750

Euclid S-7, #22146, FOB, Maumee ... $22,500

Euclid S-12, #29014, FOB, Cincinnati. $33,000

Euclid SS-18 (14TDT-36SH), #27383, FOB, Columbus $36,000

Euclid SS-18 (14TDT-36SH), #27385, FOB, Columbus $41,500

Euclid SS-18 (14TDT-36SH), #27384, FOB, Columbus $38,500

Euclid SS-18 (14TDT-36SH), #28179, FOB, Columbus $44,500

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Euclid SS-18 (14TDT-36SH), #28187, FOB, Columbus $44,500

Euclid S-18, #27786, FOB, Columbus. $38,750

Euclid S-18, #27815, FOB, Cincinnati. $43,500

Euclid TS-24, #27203, FOB, Cleveland. $55,000

Euclid TS-24, #28516, FOB, Cincinnati. $60,000

Euclid TS-24, #27206, FOB, Cincinnati. $62,500

Allis-Chalmers model 44, #753, FOB, Cleveland $4,000

Cat DW21, #8W-701, FOB, Cincinnati. $16,750

LeTourneau D, #60199, FOB, Cincinnati. $8,500

LeTourneau Super C, Cleveland ..... $2,000 ..... $2,000

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D7 Caterpillar sideboom 3T Series.
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F.O.B. Paducah, Ky. $2,500

Unit model 1020, ¾-yd. shovel, powered by GMC3-71 diesel engine. #1207.
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Galion 118 S/N MD17985 IHC UD-16A diesel, power steering, operators cab.

ATTACHMENTS

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Lima 34 swing-type fairlead. Unused.

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Northwest 25 dragline with 40' boom, and IHC UD-14A diesel engine. Serial #11190. Price FOB Greensboro, N. C. $8,500

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Cat 583, s/n 61A46, Plattsmouth, Neb.
Cat 572, s/n 21A293, South Haven, Mich.
Cat 572, s/n 21A294, South Haven, Mich.
Cat 572, s/n 21A295, South Haven, Mich.
Cat 572, s/n 21A296, Arkansas
Cat 572, s/n 21A301, Arkansas
Cat 572, s/n 21A302, Arkansas
Cat 572, s/n 21A303, Arkansas
Cat 572, s/n 21A278, near Marion, Ill.
Cat 572, s/n 2S9937, near Marion, Ill.
Cat 572, s/n 21A241, near Marion, Ill.
Cat 572, s/n 2S9938, St. Francisville, La.
Cat MD7, s/n 3T12124, Tulsa, Okla.
Cat MD7, s/n 3T10003, Tulsa, Okla.
Cat MD7, s/n 17A2243, Tulsa, Okla.
Cat MD7, s/n 17A15558, Tulsa, Okla.
Cat MD7, s/n 3T1068SP, Fisher, Ill.
Cat MD7, s/n 17A16590, Lancaster, Mo.
Cat MD7, s/n 3T8992, Lancaster, Mo.
Cat MD7, s/n 3T2738, Mode, Ill.
Cat MD7, s/n 3T3574, Mode, Ill.
Cat MD7, s/n 3T8033, Mode, Ill.

DOZERS

Cat D9 dozer & ripper, s/n 19A1168, Marion, Ill.
Cat D8 dozer & winch, s/n 14A5654, Marion, Ill.
Cat D7 dozer & winch, s/n 17A6977, Marion, Ill.
Cat D7 dozer & winch, s/n 17A9312, Marion, Ill.
Cat D7 dozer & winch, s/n 17A6283, Marion, Ill.

MISCELLANEOUS

D7 Twin Arc welder, s/n 17A541, Salem, Ill.
D7 Twin Arc welder, s/n 17A8219, Tulsa, Okla.
D7 Twin Arc welder, s/n 17A5357, South Haven, Mich.
D7 Twin Arc welder, s/n 17A16587, Plattsmouth, Neb.
D7 Twin Arc welder, s/n 17A16588, Plattsmouth, Neb.
D7 Twin Arc welder, s/n 17A16516, Plattsmouth, Neb.
D8 angle dozer, s/n 46A1806, Plattsmouth, Neb.

BACKHOES

Bucyrus-Erie 22-B Hi-Walker, s/n 121929, Plattsmouth, Neb.
Bucyrus-Erie 22-B Hi-Walker, s/n 121749, Plattsmouth, Neb.
Bucyrus-Erie 22-B Hi-Walker, s/n 115947, Marion, Ill.
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Caterpillar DW20 scraper #11C880.
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International TD-6, wide gauge, with new Holt free-spooling skidding winch, Holt hydraulic angle dozer, with front mounted pump. All the guards including overhead operator guard. This machine has been checked over and repaired as necessary. The appearance is very good. Is in good operating condition. The undercarriage averages 60% good $4,750
Caterpillar D6 tractor, 9U series, guarded up, good tractor or drawbar work.... $2,500
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Allis-Chalmers HD5 shovel loaders with new motors and like new running gear.
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Cat #29 live power c.c. Price on application.
Caterpillar #25 double drum cable control for D8 ..... $1,000
Cat D7 angle dozers ..... $400 & up
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Allis-Chalmers AD45 motor grader, late current model, tires better than 65% good. 13:00 x 24 rubber on all wheels, cab, cab heater, lights, scarifier, and 14' moldboard, all necessary repairs made, excellent operating condition. Used 35 months since new. Make an offer!

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75-hp elec. 1,175 rpm motor with starter, 440 V., 3-phase, 60 cycle with Westinghouse 50-75 hp double control cabinet starter. $600
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LaCrosse heavy duty trailer—52 ton capacity. Wt. 23,050 lbs. 10'x40' bed. 16 tires 9:00x15. Write for details.

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Bucyrus-Erie 22-B with 50' crane boom and extra counterweight, tagline. Powered with Caterpillar D318 diesel. Mounted on Maxi carrier w/8 14:00 x 20 tires. Rebuilt completely in our shops.
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1—Bucyrus-Erie 38-B combination shovel and dragline Cat D13000 Engine, serviceable.
1—Bucyrus-Erie 30-B combination hoe, shovel and dragline, GM 4-71 Engine, late model, serviced, painted, ready.
1—Bucyrus-Erie 22-B combination shovel, dragline hoe, UD-14 Engine, serviced and painted.
1—Bucyrus-Erie 10-B combination shovel, hoe, dragline, GM-2-71 Engine, late model.
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1—Koehring 304 ¾-yd. shovel GM 3-71 engine.

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1—Lima 604 shovel attachment complete, ...$3,500
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1—Bucyrus-Erie 38-B shovel attachment complete $6,500
1—Bucyrus-Erie 30-B shovel attachment complete, new.
1—Bucyrus-Erie 15-B shovel attachment complete $750
1—Bucyrus-Erie 10-B shovel attachment complete $350
1—Bucyrus-Erie 38-B 15′ two piece jib.$750
1—Lorain 79 or 80 fairlead, good condition. $175
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1—LeTourneau R-7 cable unit for Caterpillar D7, complete $450
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2—GM 6-110 engines, with clutch P.T.O., skid base, heat exchanger, safety controls for pump installation.
1—GM 6-110 engine complete, clutch, PTO speed reducer, 1.76-1 ratio, skid base with fuel tank, air intake extensions, dry type cleaners, for crusher application.
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1—Ingersoll-Rand model 90C compressor S/N 40T 47321 less power new, shop worn only, will sacrifice.
1—Eaton air receiver, 100-psi S/N 15131, 36″ O.D. 10′ length. Skid mounted with gauge and pop-off valve, new shop worn only, will sacrifice.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

3—Ingersoll-Rand 3R-36 Spot-Air skid mounted .....each $750
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1—Ingersoll-Rand DR-210 Gyro-Flo GM diesel model 43302 engine, 4 wheel pneumatic tired chassis.

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Austin-Western Master 99 motor grader, cab, windshield wipers, scarifier, lights. Price: F.O.B. Detroit $8,650
Adams model 610 grader, 14.00 x 24 tires front and rear, cab, scarifier, power steering. Price: F.O.B. Lansing $7,900

EXCAVATORS

Hopto Model 200TM demonstrator with heavy-duty boom, 24″ backhoe bucket, 24″ rotating clamshell bucket. Hopto cab and heater, 4 x 4 carrier, with cab, power steering, windshield washer, heater and defroster, fenders and running boards, front wheel locking device, nylon cord tires. Serial #3974. Price: F.O.B. Detroit..$15,000
Koehring ½-cu. yd. shovel, with GM 2-71 engine, 1948 model, rebuilt in 1956. Serial #C-6520. Price: F.O.B. Lansing.....$4,500
Straight backhoe boom and gantry for B-E 22-B. Price: F.O.B. Lansing $1,250

SCRAPERS-ROOTERS

LeTourneau-Westinghouse model "C" Tournapull with cab and 24″ tires front and rear. #GT 4434. Price: F.O.B. Detroit. $12,000
LeTourneau-Westinghouse model "D" Tournapull, 18.00 x 25 tires front and rear. Price: F.O.B. Detroit $8,500
LeTourneau-Westinghouse model S3 rooter. Like new condition. For use with tractor of 50 hp or more. Price: F.O.B. Detroit. $1,000
LeTourneau-Westinghouse model "C" Tournapull w/P-19 scraper. Engine just overhauled. Serial #4477. Price: F.O.B. Lansing $13,500
LeTourneau-Westinghouse model "C" Tournapull w/P-19 scraper. Serial #4671. Price: F.O.B. Lansing $13,500
LeTourneau-Westinghouse model FP scraper. Average condition. Price: F.O.B. Lansing $4,500

TRACTORS

TD9 International crawler tractor with Bucyrus straight bulldozer blade. Good tracks, cleaned and painted. Price: F.O.B. Detroit $5,000
LeTourneau-Westinghouse Tournatractor, or with bulldozer, 26.5x25 tires. Serial #GW 7058CW-AC. Price: F.O.B. Saginaw, Mich. $18,000

MISCELLANEOUS

Littleford 1,000-gallon distributor with 10-ft. spray bar, hand spray, mounted on Duplex truck. Price: F.O.B. St. Joseph, Mich. $1,650
Galion 3-5 ton patching roller. Call Lansing. Price: F.O.B. Dowagiac, Mich. $950
Gallon 8′ chip spreader. Call Lansing. Price: F.O.B. Bay City, Mich. $400

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Littleford model 115 Tankar Heater. Price: F.O.B. Lansing $950
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Quickway model E shovel, mounted on White tandem truck, as is.
Northwest model 25 ¾-yd. backhoe, SN 111/313, GM diesel, reconditioned.
Northwest 25 backhoe, S/N 17808, reconditioned.
Northwest 25 backhoe, S/N 19063, Cat diesel engine, reconditioned.
Northwest truck crane, model 25 S/N 11957, mounted on Dart carrier, good condition.
Northwest model 25 dragline, S/N 19078, 35' boom, Cat diesel engine, reconditioned.
Insley model L dragline and clamshell, S/N 7389 reconditioned.
Insely model K-12 dragline, S/N 1619, 35' boom, U9 IHC gas engine, fair condition.
Backhoe attachment for Northwest 25, good condition.
Shovel attachment for TL-25 Lorain, good condition.
Backhoe attachment for TL-25 Lorain, good condition.
Shovel attachment complete for LS-50 Link-Belt.
Shovel attachment for 362 Marion, 1½-yd., good condition.

AT HOUSTON

Bucyrus-Erie 10-B combination hoe and dragline, 14" track shoes, Hercules gas engine, as is.
Bucyrus-Erie 15-B dragline, S/N 114646, IHC UD-350, 35' boom, reconditioned.
Bucyrus-Erie 22-B dragline, S/N 56343, IHC UD-14, 45' boom, standard tracks, as is.
Bucyrus-Erie 22-B dragline, S/N 75283, IHC UD-14, 40' boom, reconditioned.
Bucyrus-Erie 22-B hoe, S/N 102696, standard boom, Cat D318, tractor-type tracks, reconditioned.
Bucyrus-Erie 22-B hoe, S/N 101143, standard boom, IHC UD-14A, tractor-type tracks, extra counterweight, reconditioned.
Insley model L dragline, S/N 7007, Cat D315, 40' boom, 30" track shoes, as is.
Lorain TL-20 dragline, S/N 15456, 35' boom, Cat D4400, 22" shoes, as is.
Northwest 25 dragline, S/N 11496, 30' boom, 28" shoes, GMC 3-71, as is.
Bucyrus-Erie hoe attachment (st. boom) for 15-B, as is.
Bucyrus-Erie hoe attachment, cambered boom, for 22-B, reconditioned.
Bucyrus-Erie 20-A hoe attachment with ¾-yd. Esco dipper for 22-B.
Quickway model L truck mounted combination dragline, 35-ft. boom and backhoe, S/N L2-1323, mounted on 6x6 carrier, 9:00 x 20 tires, IHC-264 on dragline, as is.
Quickway model E dragline, S/N 5560, UD-9 engine, mounted on IHC L-184 tandem truck, as is.

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AT LUBBOCK

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LETTERS FROM THE FIELD

Wanapum Dam Foundation

Sirs—Ray Day's article on the Wanapum Dam project (*May 1961, p. 14*) was very interesting to our engineers and geologist, and I'm sure it was enjoyed and appreciated by many engineers and construction men, as well as the designers, contractor and owners of the project.

I was particularly interested in Mr. Day's coverage of the slurry trench cutoff under the embankment. This cutoff was designed and made a part of the specifications and construction drawings by the engineer and owner. Intensive laboratory tests and large scale field tests were carried out, prior to acceptance of this type of cutoff, by the engineer, owner and consulting board. The Cronese Co. and American Colloid Co. were very helpful during the testing program, and Cronese Co. mixed and placed the slurry used on the Wanapum project.

Grant County Constructors elected to use a slurry trench cutoff under their fill cofferdams. Although these cutoffs were narrower than the permanent cutoff, they functioned very satisfactorily and proved the effectiveness of the slurry trench method.

Construction of slurry trenches has proceeded according to plan at Wanapum. However, without proper mixing, control and supervision, this method may not work. We have seen or know of difficulties caused by poor mixing of slurry, improper base material for slurry, and use of an inadequate volume of slurry.

"That's it, Leroy! Don't lower yourself by arguing with him."

The backfill material for a slurry trench is also very important. At Wanapum, the contractor used the same sand and gravel excavated from the trench as backfill for the cutoff under the cofferdams. We specified a mixture of excavated material and a fine sandy silt as backfill for the permanent cutoff trench. The entire mixture was thoroughly impregnated with slurry before placing in the trench.

WILLIAM H. BUSSEY
Soils, Materials & Foundation Dept.
Harza Engineering Co.
Consulting Engineers
400 W. Madison St.
Chicago 6, Ill.

Excavator Ditty

Sirs:—

A contractor passed on to me the following. It might be worthwhile for E. E.'s readers.

One Timothy O'Leary, a son of the sod—
Had only one passion, only one God.
His idol, the shovel, he mounted at dawn,
His passion to be where the digging went on.

On any new job the first face to be seen
Regardless of time, place, or machine—
Whether P&H, Koehring, or Bucyrus-Erie—
Was the broad, grinning visage of Timothy O'Leary.

His lust for the loading transported his body
From Bonneville Dam clear up Passamaquoddy.
He was working a road job one day about ten,
And he bit at a piece where some Greek powder men
Had left in a charge that failed to explode—
It deposited Tim some two miles up the road.

Well, Timothy's soul soon appeared at the gate
Where St. Peter checks over the new candidates.
"You have worshipped an image in cable and steel,
I might sneak you in if your faith you repeal."

Well, Tim looked around and saw nothing but fluff,
Rainbows, and clouds, and all that sort of stuff.
"Thanks, St. Peter, it's pretty, that's true—
But, I prefer it below where there is digging to do."

ROBERT L. SMITH
Bucyrus-Erie Co.
Kansas City, Mo.

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